DOCUMENT RESUME

ED 062 723 24 EA 004 307

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TITLE Ability, Performance, Attitudes and Process Education. An Exploratory Investigation of the Relationships that Exist Between Ability, Performance, and Attitudes of Fifth and Sixth Grade Children During Use of Curricula Identified as Process-Oriented. Final Report.
INSTITUTION Eastern Regional Inst. for Education, Syracuse, N.Y.
SPONS AGENCY National Center for Educational Research and Development (DHEW/OE), Washington, D.C.
BUREAU NO BR-6-1440
PUB DATE Jul 71
CONTRACT OEC-1-7-061440-3262
NOTE 118p.

EDRS PRICE MF-$0.65 HC-$6.58
DESCRIPTORS *Academic Performance; Childhood Attitudes; *Continuous Progress Plan; Curriculum Research; *Elementary School Students; Grade 5; Grade 6; Group Behavior; Group Relations; *Student Ability; *Student Attitudes

ABSTRACT

This investigation was conducted as an attempt to document certain aspects of small group work and their relationships with process education. Particular attention was given to such student characteristics as ability levels, quality of group performance, and attitudes toward problem solving. Small groups of students were videotaped while working on curriculums identified as process-oriented. Videotaped protocols were also recorded on the same groups while these groups were involved in nonprocess activities. Comparisons were made between several measures of group performance taken before, during, and after exposure to process curriculums. In addition, attitude and personality inventories were administered both before and after the use of process curriculums. Process-oriented activities seemed to mitigate the relationship between students' ability levels and their performances. The emphasis on conceptual activity in process curriculums is discussed as a possible explanation of this finding. Attitudes toward solving were also found to increase after exposure to process curriculums. Greater increases in attitudes were found in students who had used highly structured curriculums. (Pages 104-106 and 108-110 may reproduce poorly.) (Author)

ABILITY, PERFORMANCE, ATTITUDES

AND

PROCESS EDUCATION

An Exploratory Investigation of the Relationships that Exist Between Ability, Performance, and Attitudes of Fifth and Sixth Grade Children During Use of Curricula Identified as Process-Oriented

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Final Report
July, 1971
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ACKNOWLEDGMENTS

Classroom research is an integral part of educational research but it is usually difficult to arrange. The investigators would like to thank the following people for their contribution to the project. Their cooperation and interest has been vital to its successful completion:

The children who willingly participated

The following teachers and their principals:

Mrs. Elizabeth Farnham	Cayuga Heights	Mr. Joe Stone
Mrs. Alice Seamon	Cayuga Heights	
Mrs. Donna Friedrich	South Hill	Mr. Pat Saggese
Mrs. Marion Norberg	Northeast	Mr. Mike Bashaw
Mrs. Ernestine Wright	Northeast	
Mrs. Nancy Cohen	Belle Sherman	Mr. Lou Giantris
Mr. Elliot Golinkoff	Central	Miss Beverly Martin

Dr. Len Buyse, for the opportunity to use the Ithaca Schools

Mr. Jack Langloise and American Science and Engineering, who graciously made MATCH kits available for research

Mr. Joe Stone, for encouragement, interest, and aid in locating equipment

B.O.C.E.S., for use of video tape equipment

Staff members of E.R.I.E. at Syracuse, N.Y., particularly Dr. Richard Andrulis and Dr. William Ritz

The College of Agriculture at Cornell University and Dr. Helen Wardeberg, Head, Department of Education

And particularly, Fred L. Strodtbeck, University of Chicago, who acted in dual capacity as consultant and friend.

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INTRODUCTION

This document was prepared as a final report of a research investigation funded by the Eastern Regional Institute for Education (ERIE). ERIE has previously selected as its mission the implementation of process education in elementary schools. Unfortunately, the meaning of process education has come to be extremely connotative and ambiguous. Cole (1970) writes that, "One encounters many educators who talk and write about process education but apparently have devoted little attention to explaining what it is or how it came about."

The purpose of this investigation was to examine some questions about process education as it exists in the classroom environment. To this end, curriculum units (MATCH kits) previously identified by ERIE as exemplars of process education were introduced to fifth and sixth grade classrooms and the investigators video-taped selected activities. Specifically, this investigation was intended as an inquiry into the following questions:

1. What is the relationship between measures of students' ability (i.e., reading scores and I.Q.) and performance on process-oriented curricula?
2. Does the introduction of process-oriented curricula produce any changes in students' performance, personality or attitudes about learning in school?

3. Is video-taping a viable technique for documenting classroom behaviors in a comprehensive, accurate and unobstrusive way?

The present investigation was conducted as an exploratory inquiry into these questions. It was not intended as a controlled study in search of definitive answers. At this particular stage in the development of process education there may not exist definitive questions, let alone answers. Rather some relationships have been considered here which, if only leading to the formulation of meaningful questions, will have been deemed a productive endeavor by these investigators.

In this investigation a high priority was given to documenting behaviors as they exist naturally, in the classroom. The investigators did not engage in the kind of experimental manipulations which are indicative of much educational research. It is of paramount importance to capture the essence of what process education is and what happens to students when they are engaged in it. It is the knowledge of that essence which will ultimately lead to meaningful questions and answers about process education.

Review of Literature

Modern man faces an increasingly complex world in which "the ability to face the new appropriately is more important than being able to repeat the old" (Rogers, 1967). This statement succinctly captures the essence of a controversy which is currently a subject for debate in American education.

Laymen and educators alike are involved in arguments that center on the best means to foster "the ability to face the new appropriately." The

basic disagreement seems to be centered on the best means to achieve this end, and the central question of the argument is, does the solution require more emphasis in the areas of knowledge or content, or on the processes involved in learning?

In order to understand the basic argument, it is necessary to present a clearer definition of the terms content and process. The school teacher typically speaks of content as the body of information, whether facts, generalizations, laws or theories, which apply to a particular course of study. Process can be defined, in contrast, as the operations, ordered or random, that are associated with decision-making, and evaluating and accommodating new insights (Parker and Rubin, 1966).

In an attempt to redefine the content of curriculum, the supporters of the knowledge position focus on the acquisition of structurally oriented concepts, the "structure of knowledge" approach associated with the work of Schwab.

Arguments against the content approach to learning are summed up by Parker and Rubin (1966). The knowledge explosion has made coverage of a subject insurmountable; entrance requirements imposed by colleges and universities fetter curriculum revisions; and the increasing temperament of society with its tendency for the comprehensive school to become more academic and rigorous poses serious problems for youths with limited academic interests and capacities.

These arguments against the content-oriented approach seem to stress that traditional content-centered techniques fail to fully prepare students for the new and unexpected. Therefore, the most important objectives of

education cannot be achieved by rearranging content. (However, it is necessary to state that emphasis on processes does not negate the desirability of obtaining factual knowledge, of forming concepts and generalizations or even of rote learning should it be appropriate for problem solving.) Thus, it is to the basic processes underlying the learning phenomenon that many educators turn their attention.

Accompanying the interest in the process approach to learning is the idea presented by Rogers (1969) that the only kind of learning that is lasting and pervasive is self-initiated and involves the whole person, feelings as well as intellect. Rogers also maintains that learning is facilitated by doing, that learning is facilitated when the student participates responsibly in the learning process and that the most socially useful learning in the modern world is the learning of the process of learning (Rogers, 1969).

The work of Skinner, Suchman, and Bruner emphasizes the self-directed approach to learning. Recent literature focuses on the role of inferring or discovery learning and the restructuring of concepts according to one's experience.

According to Jerome Bruner (1960) an inquiring attitude toward a learning task is necessary for mastery in any field. Bruner (1966) also feels that central to any discipline is the particular mode of thinking and that early instruction in that mode is an aim of education. It is apparent that merely having knowledge is necessary but not sufficient for a well-informed mind, for the well-informed mind has the capacity for continuous active learning and thinking.

A focus on the process of human learning then, raises the logical question, what processes are desirable objectives for education? Cole (1970) attempts to describe these processes as skills which are needed by the learner if he is to "acquire, organize, generate and utilize knowledge in a satisfying and productive manner." Included in this list of necessary processes are the individual's perceptive, motor, cognitive, affective and social interactive skills. Cole makes clear that skills by their very nature are not task or problem specific but are generalizable ways of dealing with a multiplicity of different situations and events.

In a recent article by Bruner (1970) skilled action is described as an act "that requires recognizing the features of a task, its goal and the means appropriate to its attainment, a means of converting this information into appropriate action, and the means of getting feedback that compare the objects sought with the present state attained."

The empirical basis for the attention to skills has been well documented by behavioral scientists, though the terminology employed to describe the skills they have examined or discussed differs. In a broad sense, according to Cole (1970), the affective and social interactive process and skills essential for learning and problem-solving mentioned by Rogers (1961) and Maslow (1962), the "learned capacities" of Gagne (1970), and the "logical operations" of Piaget (Flavell, 1963) could be considered as types of process behaviors.

Further support for the importance of the acquisition of skills and interpersonal relationships to the development of the person is cited by Erikson (1950) in his discussion of the integration of the timetable of the

organism with the structure of the social institutions. Erikson states that the child's emerging ego identity is connected with his ability to use his tools and skills without feelings of inadequacy and inferiority.

Finally, justifications for the emphasis on processes and skills are noted by Cole (1970) after an extensive study of documents pertaining to the topic. The arguments for this type of learning are briefly paraphrased below:

1. The rate of change in the world makes the prediction of what knowledge and skills will be useful for the future almost impossible.
2. It is impossible to learn everything about everything therefore the process of learning how to learn is more important.
3. The increasing complexity of the world points to a need for problem-solvers.
4. Skills are generalizable.
5. Skills are permanent.
6. The emphasis on skills is an antidote for academic isolation and social irrelevancy.
7. Skills are the basis for acquiring other information.
8. Skills are required for survival of the species.

In order to better understand the nature of process skills and the kind of climate that fosters their growth, it is necessary to describe more specifically the kinds of activities that can properly be called process behaviors. Parker and Rubin (1966) state that processes exist in an infinite

variety of shapes and forms and that many exist that cannot be readily identified, much less described, due to the fact that little is known about the way people learn.

The work of Cole and others at ERIE resulted in an initial list of concepts of process which include the following: attending and orienting, flexibility and divergence in thought and interpretation, classification, translation and transformation, and problem-solving.

According to Herse, et al. (1970), implementation of these concepts of process behaviors will result in essential information gathering and processing skills, computational skills, self-initiated learning, and general problem-solving and higher order thinking. Social interactive and introspective analysis skills are valued equally with abstract conceptual skills in process learning. Process education is education that is directed toward achieving these skills. A formal definition of process education is presented by Ripple (1971) as follows: "Process education is defined as formal intervention directed toward facilitating and developing skills in the pupil that are essential to his dealing effectively with information and experience for the purpose of meaning making and attaining goals." Acquisition of these important basic skills calls for a reorientation not only of the content of education but equally important, a reorientation of teaching-learning strategies and roles.

This reorientation of teaching-learning strategies and roles highlights essential differences between traditional education and process education. The most basic difference lies in the area of what Cole (1970) calls "opposed value positions" underlying process and conventional educa-

tional practice which affect the behavior of both teacher and learner. Placed on the negative end of the continua conventional education views knowledge as absolute and true; learning as unnatural and difficult; the learner as a passive recipient of knowledge and experience; and the school as the authoritative transmitter of established values and knowledge. In contrast and on the positive end of the continua, process education views knowledge as tentative and arbitrary; learning as natural and enjoyable; the learner as an aggressive and active seeker of knowledge and experience; and the school as a setting for emergence of values and knowledge through inquiry.

Thus, teachers' roles based on values underlying conventional education tend to be authoritarian and didactic, viewing the teacher as transmitter of knowledge and keeper of discipline. Conversely, teacher roles based on values appropriate to process education tend to view the teacher as a learner in his own right; an arranger of experiences conducive to observing, questioning and hypothesizing; a motivator of student thought; and as an encourager and diagnostician of student's difficulties (Deffenbaugh, Dalfen and Ripple, 1970).

Expectations for student behavior also alter as a function of emphasis on process education. From passive acceptor of teacher's mastery and wisdom, the student moves toward self-initiated learning, toward increasing independence, self-direction and increased participation. Pupil involvement and commitment to multiple tasks is an integral part of process education as is pupil responsibility for making his own meaning. The role of the pupil in process education is to acquire and apply the competencies

and attitudes facilitating and developing skills; skills that are essential to his dealing effectively with information and experience for the purpose of meaning making and attaining goals.

As a result of this concern with process, new curricula are being developed whose objectives are the promotion of intellectual and affective skills and other generalizable behaviors mentioned in this section. A search for process curricula by personnel at ERIE has resulted in a detailed list of instructional systems, materials, and techniques published under the title, "Encounters in Thinking: A Compendium of Curricula for Process Education" (Seferian and Cole, 1970). One such curriculum identified as process-oriented was "Materials and Activities for Teachers and Children" or MATCH kits. MATCH kits are the curricula upon which this investigation is based.

The MATCH Kits

MATCH kits are self-contained multi-media kits designed to facilitate communication between elementary school teachers and their pupils. They were developed by the Boston Children's Museum during 1964-1967 through a grant by the Office of Education, U.S. Department of Health, Education, and Welfare.

The basic premise behind these kits, which are primarily two-to-three-week Social Studies units, is that words are very limited as mediators of learning and that objects and activities are needed in great variety to improve and expand the learning of many subjects (Kresse, 1968). Thus, non-verbal learning is facilitated through the use of real objects combined

with films, recordings, pictures, models, books, and maps. The emphasis on the use of concrete objects in learning is consistent with the theory of Piaget (Flavell, 1963), who hypothesizes a stage of intellectual development which is pre-symbolic and dependent upon direct experiences with objects.

The actual boxes themselves are called "MATCH" kits, the name having been derived from the project title, Materials and Activities for Teachers and Children. They are a system of materials and activities designed to communicate between students and teachers subjects that cannot be communicated very well with words. The boxes come in varying sizes and shapes and generally weigh anywhere from 40 to 80 pounds; they contain almost everything that a class of 30 children will need to work with during the two-to-three-week period that they are in use in a particular classroom.

Role of the teacher in MATCH kits. The role of the teacher and the students are not "traditional," i.e., teacher-centered, during the use of MATCH kits. The role of the teacher who is using MATCH materials and activities is to create a learning situation and then withdraw to become an "observer" of her children in the tradition originally proposed by Maria Montessori (1964 ed.). The teacher can watch pupils at work, study their performance, and gain new and further insights about the nature of their learning and peer relationships. Teachers of varying abilities and experiences can use these kits to great advantage.

Role of the student in MATCH kits. The role of the students in the use of MATCH kits varies from the traditional "passive" learner role in that the children, released from teacher-centered learning situations, have

the responsibility for learning in their own hands. Since many of the activities are designed to be used in small-group learning situations and are student-directed, children can deal with materials and learn from them directly. In many cases they handle and manipulate real objects. They wear actual garments and use actual tools (e.g., mortar-and-pestle, chopsticks, etc.). Besides encouraging student-student interaction, the kits encourage a collaborative relationship between the teacher and the children. Often they provide a participatory learning experience for the shy, withdrawn or non-verbal learner.

Description of MATCH kits. A description of the three specific MATCH kits used in this investigation follows:

The House of Ancient Greece

"To introduce the children to the everyday life of an ancient Greek household by having them excavate the villa of Good Fortune in Olythanus, Greece; to acquaint children with archeology as a tool for learning how people lived long ago"--these are the objectives of the social studies unit called "the House of Ancient Greece" (Kresse, 1968). The kit is packaged with authentic ancient artifacts (a coin 2,000 years old, pottery shards), and with reproductions of other aspects of Greek life, including Greek statues, pottery and other household objects. Other materials include an assortment of maps, photos, plans for the Villa of Good Fortune, filmstrips, and books about ancient Greece. With the help of written and illustrated "team guides," small classroom groups examine artifacts from an excavated house in ancient Greece. The flavor of a "real" dig is evidenced as the children, acting as archeologists, record their impressions, and attempt to determine from the artifacts which particular room in the Villa of Good Fortune contained the items. Using real objects such as a mortar and pestle, the students grind stick cinammon in the ancient way. Using a string wick and olive oil, they light a Greek lamp in the traditional fashion.

The Japanese Family

The objective of the Japanese Family kit is to present the suburban middle-class Japanese family; its members and how they live together, its basic belongings, family manners, types of employment, and past and more recent history (Kresse, 1968). The kit itself consists of two boxes packed with a variety of objects common to a Japanese family. It includes an authentic Japanese family album, household objects such as dishes and chopsticks, materials and directions for flower-arranging, sumi ink and brushes for the practice of calligraphy, materials to make a household shrine, and articles of clothing (clogs, tabis, and kimonas). A variety of authentic reading material is included such as the Japanese version of "Life" magazine, comic books, a poetry book, etc., as well as film loops and a record of Japanese sounds and music. Characteristic activities center around the formation of five on-going classroom "families" complete with Japanese names and histories. Through role-playing using cards which specify the various roles for members of families, students learn the duties and responsibilities of each family member. The differences between family culture in the United States and Japan are made clear in an active manner. Manners are stressed; both "table manners" and "shoe manners" (when to wear the appropriate foot coverings in a Japanese house), and how to behave at a Shinto-Buddhist altar. Other activities include tracing family history back 100 years, and the traditions that are involved in passing along the "headship" of a family, as well as the ceremony of erasing the daughter's name from the family register when she marries and leaves her home for that of her husband.

The City

The objective of "The City" kit is to introduce young children to the concept of "cityness" and to give them an appreciation for the relationship that exists between the cities men build and the lives they live in them (Kresse, 1968). The kit itself consists of two large suitcases filled with a large set of wooden model buildings in various shapes and sizes. A built-in ambiguity of form precludes any stereotypic labeling of the buildings, and enables each specific building to function at separate times as a "house," a "school" or a "shop" subject only to the imagination and feeling state of the youthful builder. The kit contains a record of city sounds, several books on lives of city dwellers, 36 mounted photographs of various aspects of city life from slums to symphonies, and large aerial photographs of cities such as Boston, New York, Los Angeles, and Washington.

> Activities which are characteristic of the kit are creating an ideal city with model buildings, making maps, matching city sounds and images, analyzing aerial photographs, and solving "typical" city planning problems such as where to locate a new superhighway.

This description of the MATCH units used in the research emphasizes the differences in specific content of the kits; however, the basic philosophy of the kits is similar. According to Kresse, the important features of the MATCH boxes seem to be these:

> they are designed as teaching/learning systems; they deal with subjects that have a high non-verbal content; they make use of real materials and activities; they place the responsibilities for learning into the hands of the learner; they provide enough related material to permit learning to proceed some distance; they have enough different kind of materials to reach all kinds of children; teachers of varying abilities can use them well; the boxes can be successfully incorporated into many curricula; the materials and objects are complete so that the teacher and the student have what they need when they want to use it; and they are manageable and practical in the classroom. (Kresse, 1968, p. 83)

The units can be used to convey content, to develop skills and to generate self awareness and confidence; learning outcomes in the cognitive, the affective, and the psychomotor domains.

MATCH as a facilitator of small groups. The importance of observation of individuals in groups is emphasized by Krech, Crutchfield and Ballachy (1962) who noted that "man does not live in a cosmos but in a microcosm." Varied groups and organizations are the warp and woof of society, and as individuals we are influenced and constrained by, formed and reformed, by our groups. The groups serve as a reference in forming beliefs and attitudes, in steering behavior, in evaluation of self, and the treatment the self receives by others. These and other person-group relations can have

important consequences for both the person and the group (Cartwright and Zander, 1968).

Groups are an essential part of classroom structure as a classroom cannot function only on the basis of teacher-pupil interaction (Johnson and Bany, 1970). Speaking about classroom groups, these same authors state that in whatever grade, class, or group children are placed, the individuals are affected in many ways by their membership in that grade or group. Children's self esteem, their sense of worth, their feelings of dignity, depend to a large extent upon the status of the group in which they are placed. The nature of the group and what occurs in the group is an important aspect of the relations between children and groups which affects both the functioning of the group and its significance for children.

The value positions which underly process education (cited earlier in this report) are concerned with the affective skills of the individual an area of development that is minimized in conventional educational practice. Affective skills of compassion, sensitivity, empathy, non-ethnocentrism and warmth in interpersonal relationships are skills cited by Cole (1970) as part of the profile of an "educated man." Process curricula such as MATCH capitalize on the importance of development of affective skills and appropriate attitudes by creating an arena (small work group) for the acquisition and practice of interpersonal skills and behaviors.

Students working in small groups using process curricula are exposed to the experiences and varied interpretations of peers, to different questions and points of view that support the value positions that knowledge is

arbitrary. Curricula such as MATCH act as powerful mediators for small group interaction in both the cognitive and affective domain.

The significance of interpersonal and social interaction in the learning process has beem emphasized recently in the literature dealing with education. Rogers (1969) states that the facilitation of significant learning rests upon certain qualities which exist in the personal relationship between the facilitator and the learner. The climate for learning increases when the learner is prized, as a separate person, valued in his own right; when he is given the freedom to experience his own feelings and those of others without being threatened.

According to Klausmeier and Ripple (1971), guided student interactions are useful in developing and reinforcing pro-social attitudes and values and social skills. Also group cohesiveness and leadership abilities may be developed in many students. Whether in a team project or a self-contained classroom situation, most students communicate and interact with one another when given the opportunity. However, traditional classroom techniques limit these opportunities for extended cooperation and group problem solving. The use of MATCH kits which are expressly designed for small group work in the classroom creates a setting eminently favorable for cooperation, group problem solving and the practice of interpersonal skills. The research reported here was undertaken with an intent to document, among other behaviors, student-student interaction and the participation in, quality of, and attitudes toward, group work.

Section II

METHODOLOGY

Sample

This investigation was conducted in ten social studies classes from five elementary schools in the Ithaca Central School District. Initially, principals from 12 elementary schools in the district were approached with information on the three MATCH units described in the previous section (The House of Ancient Greece, Japanese Family, and The City). They were asked to canvas their teachers to determine: (1) if any teachers were interested in teaching one of the MATCH units and (2) if such teachers would permit video-taped observations of selected lessons as well as allow their classes to take several paper-and-pencil measures.

Teacher response to this initial inquiry was good and the investigators then began to interview prospective teachers for inclusion of their classes in this study.

Three criteria were used for selection of classes:

1. They had to be fifth or sixth grade social studies classes with teachers willing to teach the MATCH units and permit video-taped observations of their classrooms as well as provide time for their students to take several pretest and post-test measures.

2. Teachers had to be willing to teach the MATCH units during the month of March 1971.
3. Classes had to meet as an entire group at a regular time and place in order to permit the formulation of a video-taping schedule. Many classes were not appropriate for this investigation because they operated on an independent or "contract" schedule and did not meet as an entire group regularly.

Ten fifth or sixth grade social studies classes taught by seven different teachers were identified. These ten classes served in all phases of this investigation. Five of these ten classes were fifth grade and five were sixth grades.

Since the MATCH units were designed for small group work, the teachers were asked to divide their classes into five small groups with five to six students in each group. Two of these groups in each of the ten classes were selected for in-depth analysis by the investigators. Thus, the total N for this investigation was 20 groups. Of these 20 groups, six used the House of Ancient Greece, eight used the Japanese Family and six used The City.

Data Gathering Instruments

1. Video-taped observations. Each group in this investigation was video-taped at four different points in time. Each group was taped for a ten-minute interval during each observation. Since both of the sample groups in each class were video-taped during the same class period the

order of video-taping was alternated in each classroom across the four observations. In other words, if group A was filmed first followed by group B during the first observation, then group B would be filmed first on the second observation. This procedure was used to balance any effects fatigue and concentration span would have on the performance of groups that were filmed second in a class period.

The four video-taped time observations will henceforth be referred to, in chronological order as: (1) Pretest, (2) Time 1 observation, (3) Time 2 observation, (4) Post-test. The classes in the investigation were engaged in different tasks for each of the four observations. These tasks were as follows:

Pretest. For the Pretest task each group was given a number of "pattern blocks" of various shapes, sizes and colors. The largest block they received was in the shape of a hexagon. The children were then told that there were nine possible ways of arranging the smaller blocks into a design of the same size and shape as the large hexagon. The children were next told by the investigator to "Work together in your groups until you have discovered all of the nine possible ways of making a hexagon. Be careful not to make the same design twice. When your group has found all nine designs raise your hand and we will check to see if you are correct."

Time 1. The second lesson in each of the three MATCH units served as the task for the Time 1 observation. The following outlines of these tasks are taken from the Teacher's Guide for the respective units.

A House of Ancient Greece (Olson and Kaye, 1969)

Title of Activity: E Pluribus Unum

Description: The children examine U.S. coins for information about the American civilization.

Objectives: To introduce the idea that even simple objects can tell us much about the people who made and used them.

To practice close observation as a method of acquiring knowledge about a culture.

To give the children experience working in small groups and solving problems jointly.

Materials: Six coins: three pennies, one nickel, one dime, one quarter.

(1) First tell the children that they are to become detectives. Detectives ask questions and examine evidence to reconstruct events that occurred when they were not present.

(2) Have the children imagine that six American coins have been found in the year 4270 A.D. (2300 years from now) by some people who are trying to find out about the long-lost civilization of America. Using only the coins, what could these people discover about our lives?

(3) Encourage the groups to identify as many different kinds of information offered by their coins as possible (for example, what the coin was made of, how it was made, what messages are on it, etc.). These will serve as clues to the kind of civilization that used the coins.

(4) After the groups have completed their investigations, tell the children that they have been acting like archeologists. Archeologists work in teams to solve problems. They examine objects out of the past for clues. As they collect and compare information, they begin to provide us with an understanding of how people lived long ago.

Japanese Family (Schanck and Kaye, 1969)

Title of Activity: Moving to Musashino

Materials: Table, record "Sounds of Japan," calligraphy box, calligraphy brushes, calligraphy chart, Japanese Family album, magazine, comic book, poetry book, poetry book translations.

Procedure: Tell the families that today they are going to move into a shared "home" in the classroom. Explain that many Japanese houses have a family room which is the center of most activities for a family, from eating and entertaining to studying, watching TV, and sleeping. Explain that they are going to start furnishing their own family room today with some of the things that might be found in a real one.

Give each family one item from the following list: comic book, poetry book, magazine, family album, calligraphy kit. When everyone in a family has had a chance to see the family's object, circulate the objects among the five families.

The City (Kresse, 1969)

Title of Activity: Buildings and Streets

Description: Small groups of children play with the city model in an unstructured situation.

Objectives: To acquaint the children with the model and let them have some fun with it.

To get them thinking about the elements of a city, their arrangement, and the difference that this arrangement makes to life in the city.

Procedure:

(1) Put the model and board on a table set in a convenient place away from the wall, so that children can work around all sides. Provide some chalk--white and colored--with which streets, ponds, parks, and other features can be drawn.

(2) Select one group of children to work with the model at a time. Give each group plenty

of time to work--perhaps 30 minutes or longer if things are going well.

(3) Start each group off with a clean board and with the buildings scattered around it on the table. Don't set up things in advance or leave a previous group's set up.

You won't have to organize things very much. Generally what happens is this: The children jam the board with buildings and start drawing streets every which way. Soon, however, certain agreed-upon elements emerge--a road, a church. After this, things begin to organize themselves, and the activity acquires its own momentum and direction. A design appears.

Time 2. During the Time 2 observation each group was involved in one of the final activities of the respective MATCH unit it was using. The following outlines of these tasks are taken from the Teacher's Guides for the MATCH units.

A House of Ancient Greece

Title of Activity:	Buried Villa
Description:	The children examine more reproductions and photo finds from the Village of Good Fortune. After all "finds" have been examined and all hypotheses made, each team receives its archeologists' notes explaining what the teams' objects are and what its section was used for.
Objectives:	To practice "archeological thinking," i.e., drawing conclusions from evidence found on objects. To hypothesize what life was like in the Villa 2300 years ago. To compare student hypotheses with those of real archeologists.
Procedure:	(1) Explain to the class that it was practical to have only photographs of most objects, but these photographs were taken by Dr. Robinson's team at Olynthus.

(2) Remind the class that each team will be working independently, following the instructions the Chief Archeologist will read from the team's Research Guides. Tell them that you will be available to give help when needed.

(3) As the teams finish analyzing all finds, encourage them to pull together their best thinking about each object and photograph, and about their section of the Villa. This is a high point of the "excavation"--coming to conclusions. Nevertheless, conclusions should not be arrived at hastily.

(4) When the teams complete their analyses of the sections, give them the archeologists' notes. Explain that the notes contain comments--on all objects and photographs--taken from Dr. Robinson, and other archeologists and historians. The team can compare their conclusions with the conclusions of real archeologists. This is another high point.

Japanese Family

Title of Activity: Family Memories

Description: This activity is designed to summarize and bring together the unit as a whole. Each family makes its own family scrapbook reflecting its history and also the events and experiences of the last few weeks.

Procedure:

(1) Make available the materials the families will need to make their scrapbooks.

(2) The fathers have been instructed to appoint people to do various jobs. They themselves will act as chief organizers and the other family members will arrange the pages. You'll have to give some help here depending on what is going into the scrapbooks, which are meant to be a joint family effort.

The City

Title of Activity:	New City
Description:	Groups of children work with the model to plan and build a brand new city. Each group submits its design to the rest of the class for discussion. Maps can then be made of the various designs.
Objectives:	To make the children aware that men make and change cities, that the forms they create determine what living in the city will be like, and that there are many possibilities.
Procedure:	This lesson is an extension of Activity 2, "Buildings and Streets." It differs in that the groups are now engaged in a more structured task and have the added responsibility of presenting their work to the class. (1) As the children set to work, make sure they realize that they can build any kind of city they want, but it must be planned. Their city can be round, spread out; it can have buildings in clusters, curving roads, perhaps no roads at all. (2) Have each group make an outline map of its plans and then dismantle its set-up. The group can now go on to detail its map, color it in, etc. It will be easier to compare plans if a uniform coloring scheme is used for such things as businesses, residences, recreation and shopping areas. (3) When all of the plans have been presented and mapped, hang them around the room; they will make attractive wall decorations.

Post-Test. For the Post-test each group was given a number of "Scrabble blocks." The children were told that their task was to work together in their groups to try to make as many five-letter words as they possibly could from the letters which they had. They were told by the investigators that they would have 30 minutes for this task and only correctly

spelled words were acceptable. However, the children were not allowed the use of a dictionary and were told that the group should try to reach some kind of consensus on questions of spelling. Proper nouns were not allowed.

2. Video-Tape Evaluation Form. A form was developed and used for evaluation of the video-tape protocols. A copy of the Video-Tape Evaluation Form can be found in Appendix A. This form consisted of two parts the first of which was a "Checklist for Units of Verbal Behavior." This checklist provided spaces for the raters of the video-tapes to categorize each unit of verbal behavior as either task or non-task directed. A unit of verbal behavior was defined as "a burst of speech containing an idea." It was very possible that a sentence could contain more than one unit of verbal behavior. For example, the sentence, "I don't want that factory in my city; it will pollute the air," was scored as two units since there are two ideas contained therein.

The second part of the video-tape evaluation form was used by the raters to assess the quality of group work. This quality measure was a rating scale of 20 questions divided into six dimensions or continua which were developed from the values positions representing process learning (Cole, 1970), and described in the previous section. These six dimensions were: (A) Attending/Participating, (B) Cooperation/Sharing, (C) Aggression/Non-Aggression, (D) Manipulation/Non-Manipulation of Materials, (E) Independence/Self-Directed, and (F) Emotional Climate. Each question was written as a five-point category scale on which "5" represented the highest score on the positive end of the dimension and "1" represented the lowest score on the negative end of the dimension in question. After viewing

each tape, the raters were instructed to circle the number, for each question, that best represented the quality of the group interaction corresponding to the particular dimension in question.

3. Children's Attitude Inventory. The CAI is a paper-and-pencil test, developed by the Berkeley Creativity Project (Covington, 1967), and consists of two parts. The first part deals with the pupil's attitudes about the nature of the problem-solving process, and contains 30 statements. The pupils responded yes or no to indicate agreement or disagreement with each statement. The second part, also 30 "yes-no" statements, deals with the pupil's self-confidence about engaging in creative problem-solving activities.

The child's score on each part was the total number of responses which express favorable attitudes concerning creative problem solving. In addition to the pupil's scores on each part of the measure, the present investigation also used a total score (the sum of a pupil's scores on Parts A and B).

4. California Test of Personality. The California Test of Personality (Thorpe et al., 1953), is based on the concept that life adjustment is a balance between personal and social adjustment. Personal adjustment is assumed to be based on feelings of personal security and social adjustment on feelings of social security. The CTP is a forced choice inventory, the original sources of items having been publications of psychologists and original research by the authors. Equivalent forms of the Elementary Level of the CTP were used in this investigation. The norms for this level are

based on 4,562 pupils in grades 4 to 8 inclusive in schools in Nebraska, New Jersey, New York, Ohio, Massachusetts, and California.

The following scales of the CTP were used:

Personal Adjustment

1. Self-Reliance. An individual may be said to be self-reliant when his overt actions indicate that he can do things independently of others, depend upon himself in various situations and direct his own activities. The self-reliant person is also characteristically stable emotionally, and responsible in his behavior.

2. Sense of Personal Worth. An individual possesses a sense of being worthy when he feels he is well regarded by others, when he feels that others have faith in his future success, and when he believes that he has average or better than average ability. To feel worthy means to feel capable and reasonably attractive.

3. Sense of Personal Freedom. An individual enjoys a sense of freedom when he is permitted to have a reasonable share in the determination of his conduct and in setting the general policies that shall govern his life. Desirable freedom includes permission to chose one's own friends and to have at least a little spending money.

4. Feeling of Belonging. An individual feels that he belongs when he enjoys the love of his family, the well wishes of good friends, and a cordial relationship with people in general. Such a person will as a rule get along well with his teachers or employers and usually feels proud of his school or place of business.

5. Withdrawing Tendencies. The individual who is said to withdraw is the one who substitutes the joys of a fantasy world for actual successes in real life. Such a person is characteristically sensitive, lonely, and given to self concern.

Social Adjustment

6. Social Standards. The individual who recognizes desirable social standards is the one who has come to understand the rights of others and who appreciates the necessity of subordinating certain desires to the needs of the group. Such an individual understands what is regarded as being right or wrong.

7. Social Skills. An individual may be said to be socially skillful or effective when he shows a liking for people, when he inconveniences himself to be of assistance to them, and when he is diplomatic in his dealings with both friends and strangers. The socially skillful person subordinates his or her egoistic tendencies in favor of interest in the problems and activities of his associates.

8. Anti-Social Tendencies. An individual would normally be regarded as anti-social when he is given to bullying, frequent quarreling, disobedience, and destructiveness to property. The anti-social person is the one who endeavors to get his satisfactions in ways that are damaging and unfair to others. Normal adjustment is characterized by freedom from these tendencies.

9. School Relations. The student who is satisfactorily adjusted to his school is the one who feels that his teachers like him, who enjoys being with other students, and who finds the school work adapted to his level of interest and maturity. Good school relations involve the feeling on the part of the student that he counts for something in the life of the institution.

Both the CAI and equivalent forms of the CTP were given as pre- and post-test paper-and-pencil measures. These two instruments were given as one document. This document can be found in Appendix A.

5. Teacher Questionnaire. At the termination of MATCH kit use all teachers were given a seven-item questionnaire designed to elicit teacher comments and attitudes toward the MATCH units. A sample of the questionnaire can be found in Appendix A.

Procedure

The teachers in the investigation were asked to administer the paper-and-pencil pretest measures during the first week of March, 1971. It was also during the first week of March that the investigators visited each of the classrooms in the sample to explain to the students what would happen

in the course of the next month. Students were told that the investigators would be visiting their classrooms on four different times and on those visits would video-tape some groups at work. At the time of this initial visit the investigators brought with them the video-taping equipment they would be using during the observations. The nature of the equipment was explained to the students and they were all video-taped at that time and allowed to see themselves on the monitor. This was done so that students would not be self-conscious or ill-at-ease during the later tapings. The children were then asked to ignore the investigators on subsequent visits and simply go on about their business as usual.

On Wednesday, March 3, a teacher training session was held at Cornell University for all teachers involved in the investigation. The purpose of this session was to provide the teachers with some instructions on how to use the MATCH units. An expert on MATCH from the Eastern Regional Institute for Education provided a demonstration of the proper use of the MATCH units in specific and a more general workshop on the teacher-learner role positions required for successful implementation of process learning.

During the week of March 8th the investigators visited all classes and video-taped the Pretest activity. The teachers then began to use the MATCH units in their classrooms according to an a priori staggered schedule established by the investigators. The Time 1 observation was the second activity for all three of the MATCH units used. The Time 2 observations came as one of the last activities in each of the MATCH units. Two weeks passed between the Time 1 and Time 2 observations. The Post-test activity was video-taped during the week of April 5th. Teachers administered the

post-test paper-and-pencil measure sometime during the week of April 19th. It was also during this time that the teacher questionnaires were collected as well as unsolicited comments about the MATCH units from some students.

Treatment of Data

The video-taped protocols were analyzed by the investigators. Exactly ten minutes of tape was analyzed for each group. Each unit of verbal behavior was registered as either task-directed or non-task-directed. Small segments of tape were played over and over until the investigators reached agreement as to the content and nature of each unit of verbal behavior. This was necessary since the investigators, in their desire not to disrupt the natural classroom environment, did not prearrange students nor use the kinds of obtrusive video-recording equipment which would have produced highly organized and coherent protocols if, however, somewhat fabricated. Thus, although the video-tapes recorded in this investigation were, at times, difficult to evaluate due to occasionally obscured faces and the confounded speech bursts of several children speaking simultaneously, the investigators feel that they have captured the natural and spontaneous activities of children working in groups. On the average, each ten-minute segment took two hours for the investigators to evaluate. The percentage of task-directed verbal behavior for each group was then computed.

The investigators then rated each group along the seven process-oriented dimensions developed from the literature on process learning. The means for each group on each of the seven dimensions were calculated. Internal consistency coefficients for the group means on the seven dimensions

were significant at the .01 level and therefore only the overall group means across all seven dimensions were used as an index of group quality in data analysis.

Mean reading scores and mean I.Q. scores were also computed for each group and used to analyze the relationship between ability level and group performance.

Most of the data analysis used in this investigation were of a correlational nature due to the fact that the purpose here was to determine relationships between ability, personality, attitudes, participation and quality of group process-oriented interactions. All computations are made with mean group scores and not individual scores.

Section III

RESULTS

Raw data collected in this investigation are reported in Appendix A. Figure 1 represents the percent of task-directed units of participation for all groups across the four video-taped observations. The mean quality ratings for all groups across the four video-taped observations are plotted in Figure 2. Both graphs illustrate similar patterns across time. A decrement was found in both the relative amount of task-directed participation and the mean quality rating from the Pretest to the Time 1 observation. At the Time 2 observation both the percent of task-directed participation and the mean quality rating returned to approximately the same level at which they registered on the Pretest. The Post-test revealed an increment in both the percent of task-directed participation and the mean quality rating.

A more precise estimate of the relationship between the relative amount of task-directed participation and the quality of group work can be obtained from an examination of the correlation coefficients between each group's percent of task-directed participation and its mean quality rating. These coefficients of correlation are reported in Table 1. From Table 1 it is clear that there was a consistent, moderate and positive relationship between the relative amount of task-directed participation and the overall quality rating that each group received.

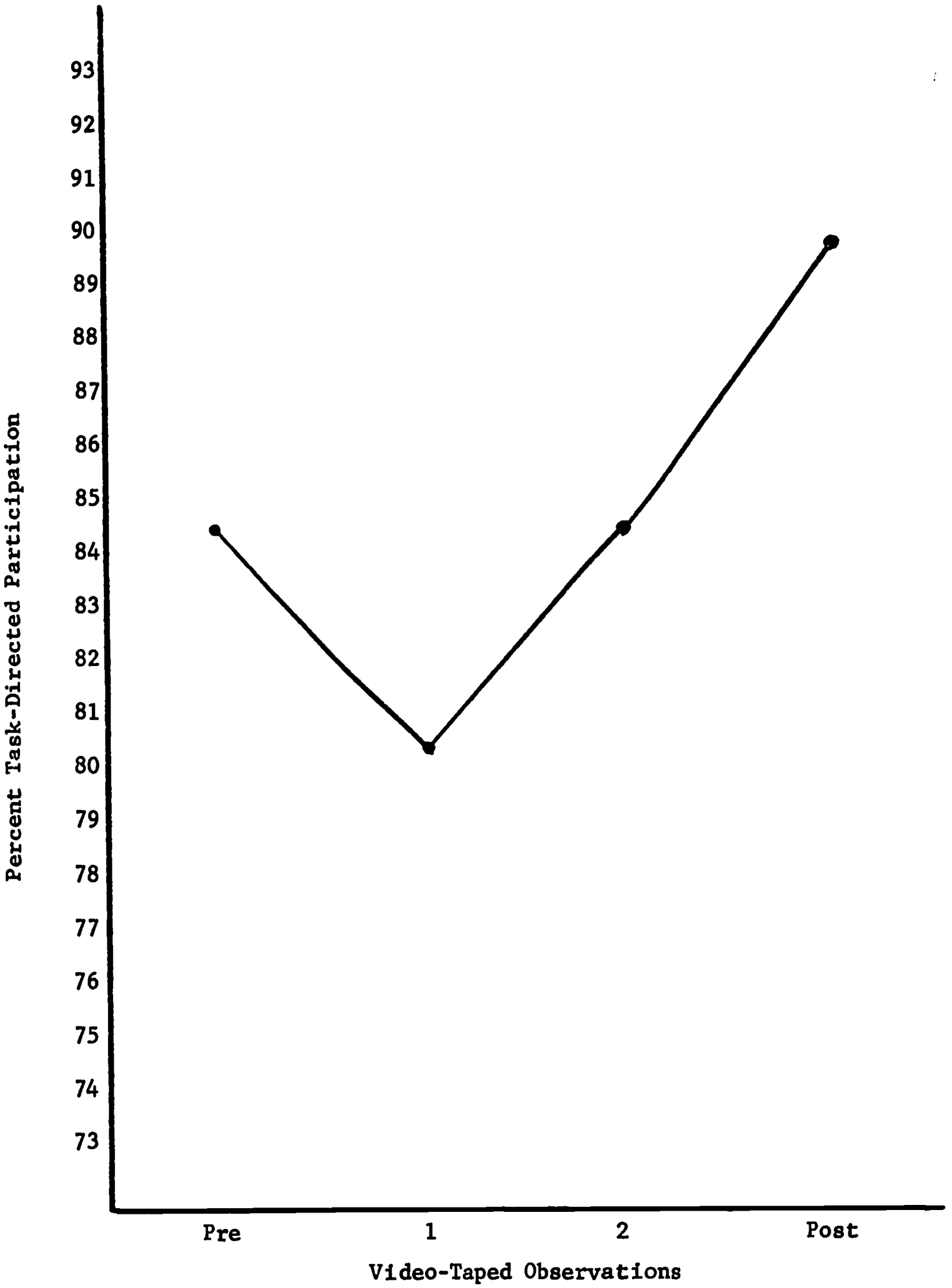

Fig. 1. Mean percent of task-directed participation across time.

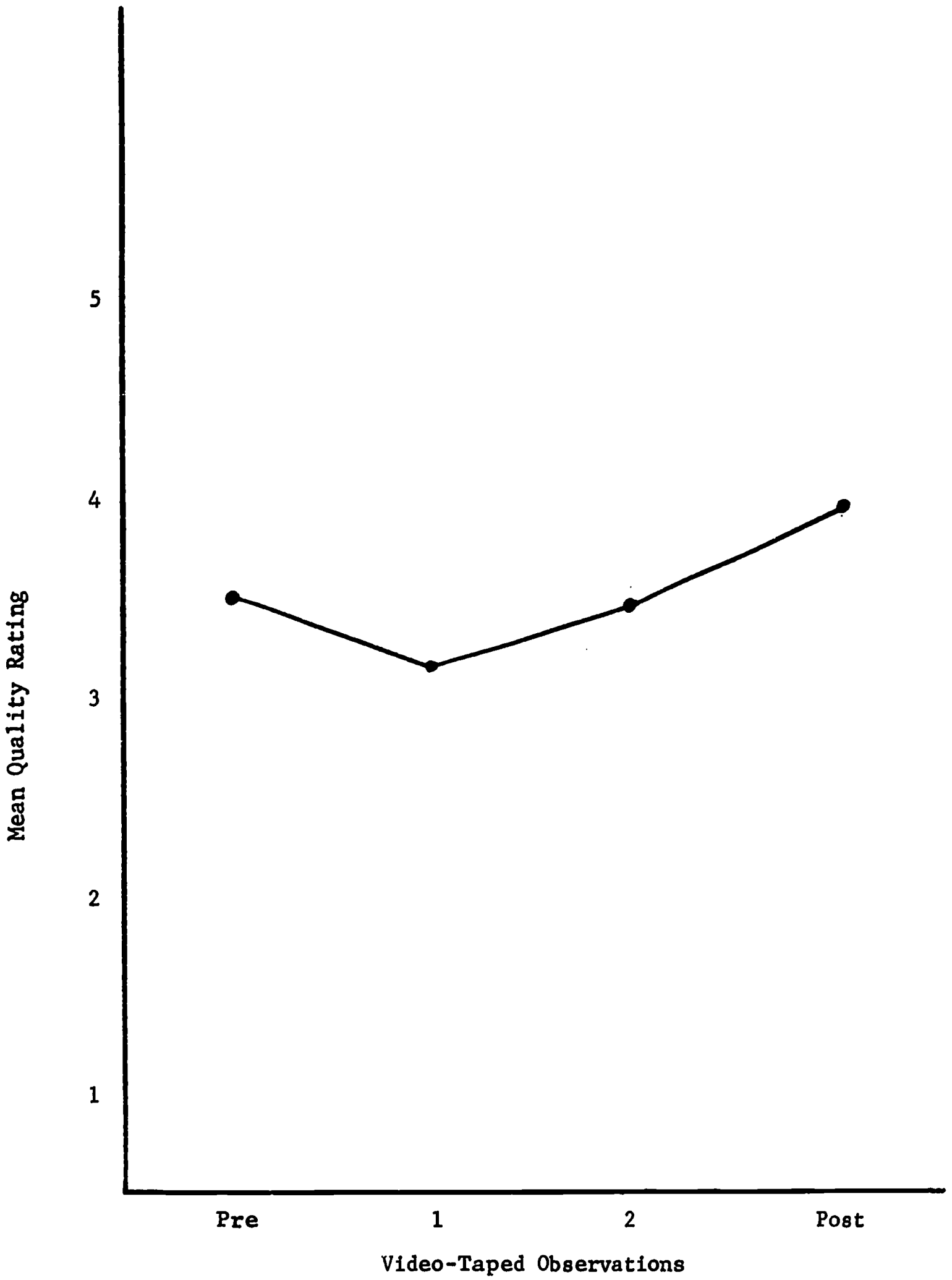

Fig. 2. Mean quality ratings for all groups across time.

Table 1. Coefficients of Correlation between Percent of Task-directed Participation and Quality of Group work

Observation	r
Pretest	.701
1	.614
2	.552
Post-test	.660

Tests of significance computed between the Pre- and Post-test scores for both the percent and task-directed participation and the group quality ratings indicated that increments in both measures reached significance at the .05 confidence level.

In order to determine the extent to which a relationship existed between reading ability and the relative amount of task-directed participation, as well as the quality of group work, Spearman rank-order correlation coefficients were calculated between the average reading score for each group and both its percent of task-directed participation and its mean quality rating. Similar correlations were computed using the average intelligence quotient for each group in place of the average reading score. These correlation coefficients were computed for all four observations and are reported in Table 2.

From Table 2 certain trends are discernible. The average reading scores for the groups were positively related to the percent of task-directed participation and to the quality rating of group work on the

Table 2. Coefficients of Correlation of Average Reading and IQ Score for Each Group with Percent of Task-directed Participation and Quality Rating for All Observations

	Reading Score	IQ
Percent of Task-directed Participation		
Pretest	.471	.509
1	.162	.501
2	-.097	-.234
Post-test	.046	.580
Quality Ratings		
Pretest	.632	.735
1	-.064	.337
2	.175	.252
Post-test	.158	.620

Pretest. The relationships that existed on the other three observations were negligible. IQ's tended to be positively related to the percent of task-directed participation and to quality on the Pretest and Post-test while relatively small correspondence appeared during the observations when the MATCH units were in use. This trend is particularly apparent in the correlations between IQ and quality. [Note the exception in the correlation between IQ and task-directed participation for Time 1 in Table 2.]

An increment was found in the total CAI scores for each group from the Pretest to the Post-test. This increase was significant at the .01 level of confidence. A breakdown of the total CAI scores into their

component scores revealed that the mean group scores for Part A (Attitudes Toward Problem Solving) yielded an increase from Pretest to Post-test which was significant at the .01 confidence level. The increment in the mean group scores for Part B (Confidence in Problem Solving) did not approach significance. A high, positive relationship was found between the mean group CAI scores from Pretest to Post-test. The Pearson Product Moment coefficients of correlation for Pretest and Post-test CAI scores were: .864 - total scores; .839 - Part A scores; .729 - Part B scores.

None of the mean group scores for the nine scales of the California Test of Personality that were used in this investigation demonstrated significant increments from Pretest to Post-test. Conversely, one scale produced a decrement significant at the .05 level and three scales indicated decrements significant at the .01 level. These scales were Sense of Personal Freedom ($p < .05$), Feeling of Belonging ($p < .01$), Social Standards ($p < .01$), and School Relations ($p < .01$).

The investigators in their interest to determine the causes of these decrements informally interviewed a number of students concerning their responses to the second CTP. They found that the overriding sentiment of the students interviewed was that of extreme annoyance over having to take the second form of the CTP. Their irritation stemmed from: (1) an inability to understand the utility of taking a test so similar to one they had taken several weeks earlier, (2) the length of the test, (3) the personal nature of some of the questions.

It is the investigators' contention that these negative attitudes on the part of students toward the second form of the CTP precluded an accurate

assessment by the instrument. For this reason any interpretation of these scores must be highly suspect. Therefore, attention will be drawn to less dubious data.

In order to determine the extent of relationship between the groups' attitudes toward problem solving and the amount of relative task-directed participation they produced, correlation coefficients were computed between mean group scores on Part A of the CAI and the percent of group task-directed participation. Similar correlations were computed between mean Part A CAI scores and group quality ratings. These computations are reported in Table 3 for all four observations in this investigation. Relatively high, positive correlations were consistently found to exist between attitudes toward problem solving and quality of group work. No such relationship was found between attitudes toward problem solving and the relative amount of task-directed participation.

Table 3. Coefficients of Correlation of Group Mean Part A CAI Scores* with Percent of Group Task-directed Participation and Quality Rating

	Pretest	Observation 1	Observation 2	Post-test
Percent Task-directed Participation				
Part A, CAI	.314	-.038	.132	.050
Quality Rating				
Part A, CAI	.491	.525	.509	.516

*In correlations with the Pretest and Time 1 observations scores from Part A of the CAI taken as a pretest were used. For correlations with Time 2 and Post-test observations scores from Part A of the CAI taken as a post-test were used.

Groups were divided into three categories according to which MATCH kit they used and results were analyzed to determine differential effects of the three MATCH kits. The average amount of task-directed participation and the average quality for all groups using each of the three kits is reported in Table 4. Figure 3 is a graphic representation of the relative amount of task-directed participation produced by all groups using each of the three MATCH kits employed in this investigation. The graph of quality ratings for groups using the different MATCH kits is reproduced in Figure 4.

Figure 3 illustrates an obvious decrement in the relative amount of task-directed participation from the Pretest to the Time 1 observation for the groups using the House of Ancient Greece. This decrease is largely due to one group which became greatly distracted from the task at hand during the Time 1 video-taped observation. This group went from 90.6 percent task-directed participation on the Pretest to 41.0 percent at the Time 1 observation. Therefore, the seemingly large decrement in the percent of task-directed participation from Pretest to Time 1 for groups using H.O.A.G. is somewhat spurious since most of this decrement can be accounted for by one group.

Figures 3 and 4 indicate that the Post-test showed increments for all three MATCH kits on both the relative amount of task-directed participation and quality. The increment from Pretest to Post-test for each of the three MATCH kits on both percent of task-directed participation and quality rating is significant at the .05 level.

Analyses of covariance were computed for each of the three MATCH kits in order to determine if any differential effects were associated

Table 4. Mean Group Percentage of Task-directed Participation and Mean Group Quality Rating for Each MATCH Kit

	Mean Percent Task-directed Participation	Mean Quality Rating
I. H.O.A.G.		
Pre	90.93	4.36
1	74.72	3.79
2	90.60	4.16
Post	92.58	4.43
II. Japanese Family		
Pre	84.38	3.38
1	83.44	2.82
2	84.34	2.75
Post	87.54	3.67
III. City		
Pre	77.83	2.93
1	81.28	2.92
2	78.10	3.40
Post	89.13	3.50

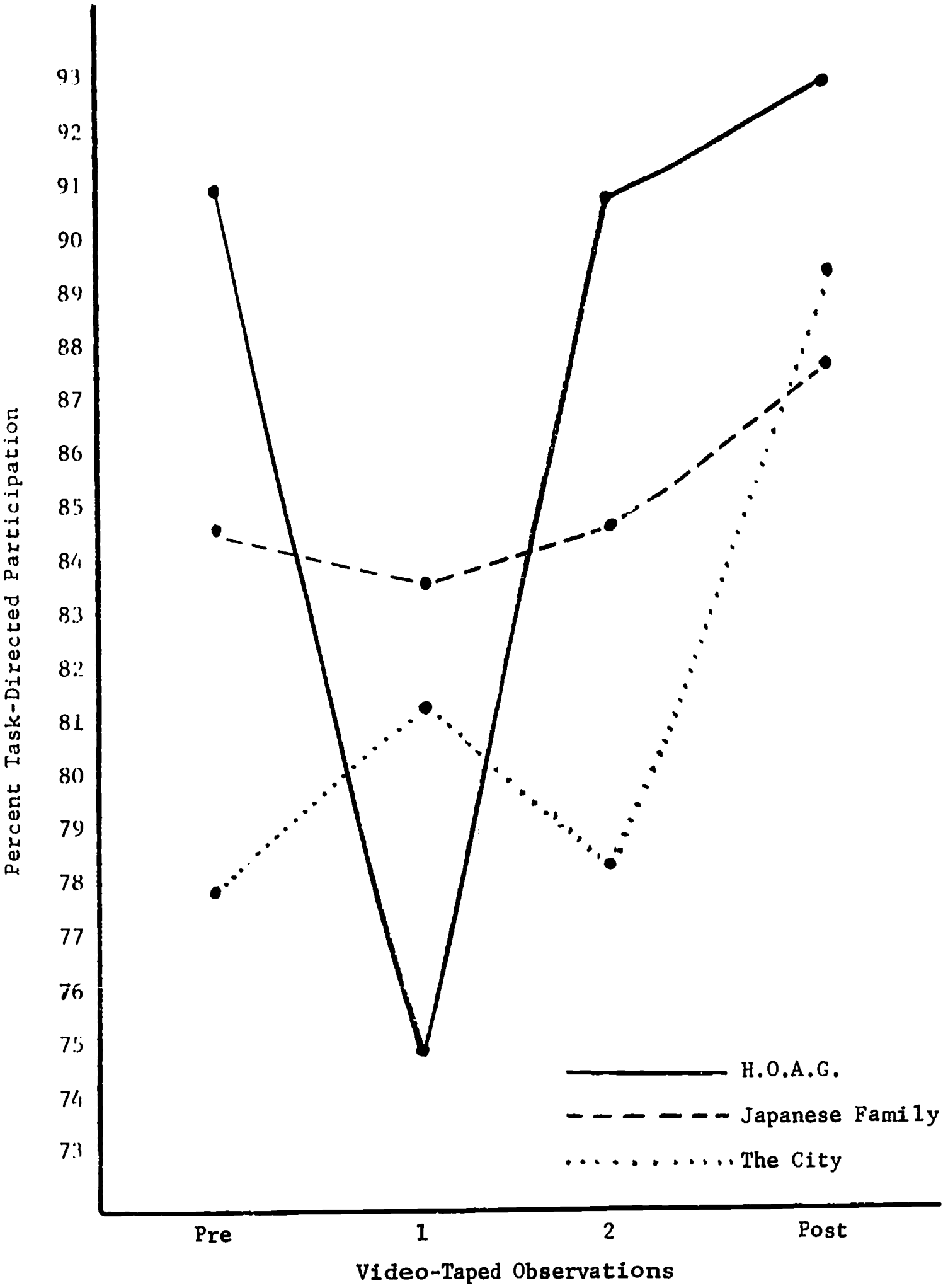

Fig. 3. Mean percent of task-directed participation across time for each of the three MATCH kits.

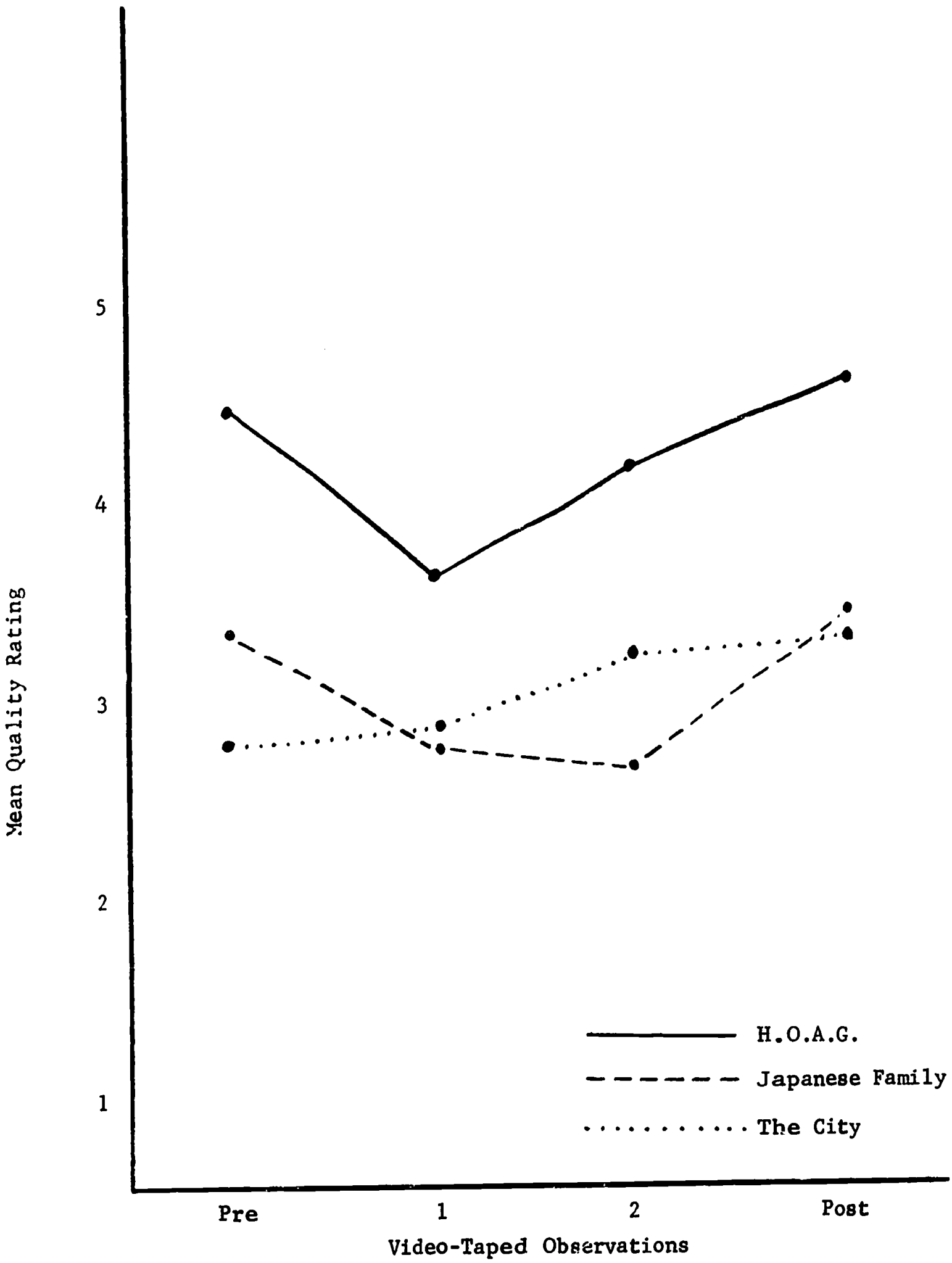

Fig. 4. Mean quality ratings across time for each of the three MATCH kits.

with the MATCH kits in the relative amount of task participation, quality of group work and group attitudes toward problem solving. The results of these analyses are reported in Table 5.

Significant increments were found between Pretest and Post-test measures in percent of task-directed participation, quality of group work and attitudes toward problem solving. Note that, however, a differential effect was found between MATCH kits only with regard to attitude toward problem solving. Students using the House of Ancient Greece showed greater increments in attitudes toward problem solving than did students using either the Japanese Family or the City units. This finding was significant at the .01 confidence level.

Teachers' responses to the informal questionnaire given them at the termination of this investigation to solicit their attitudes toward the use of the MATCH kits are reported in Appendix C. Also in Appendix C are the unsolicited responses from students concerning their reactions to experiences with the MATCH kits. An examination of these documents will reveal a consistently high, favorable attitude on both the part of teachers and students toward the MATCH kits. Further evidence of the positive reception of the MATCH kits is demonstrated by a letter drafted by five of the teachers who used the kits, urging the Ithaca School District to purchase MATCH kits for permanent use.

Table 5. Analysis of Covariance

I. Analysis of Covariance for Percent of Task-directed Participation on Pretest and Post-test Measures Across MATCH Units.

Source	df	SSx	SSy	Sxy	SSy·x	MSy·x	F
Among Means	2	581.41	171.43	85.54	177.26	88.63	1.18
Within Groups	14	1757.26	1063.36	230.65	1048.53	74.90	
Total	16	2338.67	1234.79	145.11	1225.79		

II. Analysis of Covariance for Quality Ratings on Pretest and Post-test Measures Across MATCH Units.

Source	df	SSx	SSy	Sxy	SSy·x	MSy·x	F
Among Means	2	7.03	4.29	5.26	.69	3.45	.75
Within Groups	14	2.87	6.76	.98	6.43	.45	
Total	16	9.90	11.05	6.24	7.12		

III. Analysis of Covariance for CAI Scores (Part A, Attitudes Toward Problem Solving) on Pretest and Post-test Measures Across MATCH Units.

Source	df	SSx	SSy	Sxy	SSy·x	MSy·x	F
Among Means	2	58.42	105.99	77.95	75.14	37.57	70.36**
Within Groups	14	106.84	172.10	101.78	7.48	.53	
Total	1y	165.26	278.09	179.73	82.62		

**p < .01.

Section IV

DISCUSSION AND RESULTS

A brief caveat may be appropriate here as a prelude to any discussion of the findings of this investigation. The danger lies in any attempt to make causal inferences which the data cannot support. The data of this investigation do not lend themselves to the revelation of the causal implications of MATCH kit use. This is primarily due to the fact that no control groups (groups not using MATCH kits) were included. However, it was not the objective of these investigators to determine the effects of MATCH kit use per se. Rather the investigators desired to address themselves to the complex relationships that exist between ability, attitudes, participation in group activities and the quality of group work in the context of a learning environment consistent with the value positions of process education. To this end, the MATCH kits as previously identified exemplars of process curricula, provided such an environment.

A second qualification as a preface to the interpretation of results is perhaps also appropriate. The entire interval over which the data of this investigation were collected was a mere eight weeks. The length of time that the MATCH kits were in use in any given classroom was but three weeks. The problem of finding significant shifts in complex human behavior patterns over such a short period of time is second only to the question of

the perpetuity of the new behavior patterns when such shifts have occurred. The scope of the present investigation did not include longitudinal assessment of any changes that accrued.

Keeping these considerations in mind it is yet of importance to note that significant increments in several areas were found in this investigation. Significant increases were found in attitudes towards problem solving, the amount of task-directed participation and the quality of group work. The probability that the MATCH kits have causal responsibility for these increments is certainly high. However, turning to the question of the relationship to which this study has been directed, a discussion of each will follow.

Participation and Quality

The moderate, positive, and consistent relationship found between the relative amount of task-directed participation and the quality index of group work is not surprising. To a certain extent, the more groups direct themselves to the task at hand, the more they are likely to perform better on any criteria. However, the criteria used in this investigation to assess group quality were those dimensions of group interaction consistent with the value positions of process learning. Several of these dimensions (i.e., Aggression/Non-Aggression, Emotional Climate) are related to the affective domain. Such dimensions may not be related to task-directed participation. Research on group performance (Katz and Kahn, 1966; Fiedler, 1958; and Carter, 1949, 1950, 1951) has identified two basic dimensions of group interaction: (1) task directed and (2) socio-emotional supportive. The ingenious contingency formulation of Fiedler

(1964) conceptualizes the relative effectiveness of either dimension as dependent on the structure of the group and the nature of the task.

Fiedler has distinguished two types of group structure; "coacting" and "interacting." A coacting group is one whose members virtually work individually on a given task. An example of a coacting group is a track team. An interacting group, on the other hand, is one whose members are interdependent in achieving goals defined by the task. An example of an interacting group is a basketball team. The dimension of socio-emotional supportiveness has negligible import on coacting groups since interaction between group members is not a factor in group success. In a coacting group the dedication of each member to the task is of paramount importance. However, in an interacting group where success is dependent on interaction between group members, the dimension of socio-emotional supportiveness becomes crucial for group effectiveness.

Oftentimes when teachers arrange for small group work in their classrooms the groups are coacting and their only qualification for the rubric "group" is their spatial propinquity. The children merely work individually on the same task sharing the same area and perhaps the same materials. On the other hand, the MATCH kits cultivate a group structure which is truly interacting. The MATCH kits facilitate an interacting group structure by presenting tasks that require group interaction. With the necessity of group interaction the dimension of socio-emotional supportiveness assumes importance (along with task-directedness). Thus, the MATCH kits place children in environments where they are inclined to learn skills of interpersonal relations since these skills are, to some extent, prerequisites of the task.

Since the quality index used in this investigation contained considerations of interpersonal relations, it was in a sense, a measure of the socio-emotional supportive dimension of the groups. Given the nature of the MATCH kits it would not be expected, then, that the relationship between task-directed participation and group quality would be exceedingly high. The results of this investigation are in accord with this thinking.

One of the most positive aspects of MATCH kits as exemplars of process curricula may be their ability to provide learning environments with balanced emphasis on requirements of task and requirements of interpersonal relationships. This balance may have been traditionally neglected in our educational system and yet very necessary if education is to be provided for the "whole man." Some of the current difficulties society faces in the realm of interpersonal relations gives testimony to both the neglect and the need.

Ability

Despite the long history of democratization of education in this country the rewards of learning may have been less than equally dispensed. There is no dearth of information on the high relationships that exists between school achievement and some student characteristics such as reading ability and I.Q. This is supported by the relationship found on the Pretest of this investigation. In general, reading scores and I.Q. were correlated relatively high with task-directed participation and group quality ratings initially, however, interesting trends occurred in these relationships during the time interval of the investigation.

For all observations after the Pretest, reading ability exhibited virtually no relationship with either the relative amount of task-directed participation or the quality of group work. Similarly, I.Q. scores exhibited a marked decrease in their relationship with the percent of task-directed participation and the quality of group work on the observations made during MATCH kits use (Time 1 and 2 observations). These findings suggest that the use of the MATCH kits decreased the degree of relationship between ability measures (reading and I.Q. scores) and performance measures (percent of task-directed participation and quality ratings). There are several possible explanations for these findings.

The most obvious explanation lies in the fact that this phenomenon is very consistent with the stated nature of MATCH. The MATCH kits purportedly emphasize non-verbal learning. Reading scores and the I.Q. scores used in this investigation (Lorge-Thorndike) are measures of verbal ability. It is, therefore, not very surprising that strong relationships between ability and performance were not found during MATCH kit use.

A second possible explanation is perhaps not so obvious. This argument is based on the premise that reading scores and I.Q. scores are not really indicators of a student's ability to learn. Rohwer (1971), speaking to just such a thesis, has reviewed numerous studies dealing with measures of learning proficiency. His review indicates that the discrepancy between scores obtained by Negro children and scores obtained by white children on various intelligence and achievement tests is contingent upon the instrument used. Furthermore, Rohwer contends that this variance in population difference cannot be explained by the Jensen (1969) model which

postulates two general varieties of learning ability--associative and conceptual. Rohwer mounts impressive evidence to indicate that some of the tasks Jensen referred to as conceptual draw mainly on what he called associative ability while some that he referred to as associative draw on conceptual processes.

Rohwer offers a revision of the Jensen model based on two dimensions. The first dimension refers to the task: does it principally require the recall of information or the application of skills acquired previously, or does it require the acquisition or production of new information or skills? Rohwer's second distinction concerns the kind of conceptual activity involved, formal vs. imaginative. The major implication of the Rohwer model is that "any type of learning proceeds best when conditions are such that conceptual activity is elicited in the learner." He substantiates this implication by citing evidence that conceptual ability does not vary with SES as Jensen (1969) argued. What does vary with SES are those acquisition-production and recall-application skills which are tapped by many intelligence tests and all reading tests. However, since it is precisely those skills of acquisition and recollection which are most important for success in school, tests of intelligence and reading ability are highly correlated with school success even if they are not indicators of conceptual learning proficiency.

That the MATCH kits emphasize conceptual activity is evident from the fact that the activities of the kits require process skills and minimize the need for acquisition on recollection skills. Indeed, the rationale for process education in general, as indicated in Section I, de-empha-

sizes the importance of acquisition and recollection skills and emphasizes the importance of certain conceptual skills referred to as "processes." The original rationale for this shift in emphasis has been mentioned earlier and will not be repeated here. However, this shift in emphasis may have produced an unanticipated but abundantly desirable corollary effect. Process education, by virtue of its emphasis and value positions, may attentuate individual differences in ability and their concomitant effects on learning precisely because the kinds of abilities which are necessary for success in process-oriented learning situations are those in which individual differences are minimal. This is not to say that process curricula must be anathema to acquisition and recollection skills. Indeed, a process approach to learning may provide unprecedented opportunities for acquiring information and skills missed because of inappropriate early environmental experience. Perhaps these opportunities should simply be tailored to the student's relative propensity for formal or imaginative conceptual activity.

The idea that MATCH kits attenuate the effects of individual differences (as indexed by learning proficiency measures) on performance is further substantiated by the results obtained on the Post-test. The relationship between mean I.Q. and group performance returned to the approximate level that was found on the Pretest. This is not surprising since the Post-Test (an anagram task) presumably tapped recollection skills. However, a corresponding trend did not occur with regard to the relationship between reading scores and performance. The Post-test correlations of reading scores with percent of task-directed participation and quality

ratings did not return to their relatively high Pretest levels. As a matter of fact, these correlations remained negligible. That the obviously verbal anagram task did not show a relationship to reading ability may be less related to use of the MATCH kits than an indication of the limitation of reading scores as predictors of school success. Reading scores may tap kinds of verbal recollection skills other than those required for success on an anagram task. This gives further testimony to the notion that the high relationship that exists between reading scores, I.Q., and school achievement may be due more to the limited range of skills presently appropriate for school achievement than to the validity of such measures as indices of learning proficiency.

Attitudes Toward Problem Solving

A most interesting finding was obtained by correlating attitudes toward problem solving with percent of task-directed participation and group quality ratings. No relationship was observed between attitudes and the relative amount of task-directed participation. However, a moderate positive relationship was found between attitudes and quality ratings. It seems that even children with negative attitudes toward problem solving will participate in group problem-solving activities but their participation may be of lower quality than students with positive attitudes. Of course the idea that attitudes are related to performance is not a new one. Poor attitudes underlie poor motivation and poor motivation often precludes effective and spontaneous use of problem-solving abilities.

A more interesting and significant finding of this investigation has to do with the increments observed in attitudes toward problem solving.

Of particular interest is the finding that, while significant increments in attitudes toward problem solving were found across all MATCH kits, the students who had used the House of Ancient Greece (H.O.A.G.) registered far greater increments than students exposed to either the Japanese Family or The City.

Before attempting an explanation for this differential increment in attitudes toward problem solving, the investigators would like to eliminate the possibility that it was caused by greater attractiveness of the H.O.A.G. kit over the others. Although there is no empirical evidence to substantiate this, the investigators maintain that there was no difference in the perceived attractiveness of each of the MATCH kits by the students who used them. This opinion is based on the investigators' observations of the sheer delight with which the students confronted the rich materials contained in all of the MATCH kits.

A more feasible explanation for the differential increment in attitudes may lie in structural differences of the MATCH kits. The H.O.A.G. kit seems to be more structured in terms of stated role expectations, and objectives and requirements of task than either of the other two kits. The H.O.A.G. kit both clearly defines the roles of group members and the expectations of those roles vis-a-vis the task at hand. In the Japanese Family roles are certainly defined, however, implementation of those roles in task situations is left largely up to the creative inclinations of the group members.

The City provides virtually no structured role differentiation among group members nor even provision for group leadership. For an illustration

of these structural differences the reader is referred to Section II of this document where the activities of each kit for the Time 1 and 2 observations are outlined. Clearly the role expectations for a group of archeologists considering the nature of an artifact are more defined and concrete than members of a family organizing their souvenirs or citizens planning a city. The superiority of structural definition of the H.O.A.G. kit seems consistent across all activities.

This brings up the interesting question of the student's need for structure. There are no easy answers to this question. However, this point exceeds the scope of this investigation and the question of structure will be left for future considerations.

Section V

SUMMARY AND SUGGESTIONS FOR FURTHER STUDY

Summary

This study was an attempt to document aspects of small group work in classrooms engaged in the process education curricula called MATCH. Data on student-student interaction and the participation in, quality of, and attitudes toward small group work were gathered by video-taped observations and paper and pencil measures.

The MATCH curricula (The City; Japanese Family; The House of Ancient Greece) were used in five fifth- and five sixth-grade social studies classes for an hour a day over a two-to-three week period in five different elementary schools during March 1971.

All students in the ten participating classrooms worked with the MATCH kits in small groups during the period reported by this study. However, only two randomly selected groups in each classroom were chosen for video-taped observations (a total of 20 groups) with five or six children in each group. Approximately 100 children comprised the study groups which were video-taped on four separate occasions; pretest, post-test and two observations during use of MATCH curricula. Video-tape observations were ten minutes in length.

A preliminary visit to all participating classrooms before pre-testing was undertaken to acquaint the children with the aims of the

project ("we want to look at how small classroom groups work together") and to familiarize them with the video-tape equipment and its operation. All children were given the opportunity to speak into the microphone and to view themselves on the T.V. monitor. This exercise was a precaution to preclude unnecessary disruption of the classroom due to taping once the investigation proper began.

Pretesting of the small groups, both video-taping of selected groups and paper and pencil measures (The California Test of Personality and the Children's Attitude Inventory) was begun March 8, 1971. Taped pretests took the form of a pattern-block task with a group product as a final outcome.

Immediately following pretesting, teachers began instruction with MATCH kits. Video-taping of the MATCH kits in use occurred during an early and a concluding lesson of the curricula. The intervening time between these observations for all groups taped was approximately three weeks.

Post-testing, both video-taped and pencil and paper measures (CTP and CAI) was done during the week of April 15, 1971. The video-taped post-test task consisted of an anagram task requiring proper spelling of five letter words using "Scrabble" tiles. Words formed were judged as products of group activity.

Analysis of the data included ratings of the 80 observations by the investigators, using a specially constructed video-tape evaluation form which was based on value dimensions developed from literature on process learning. This form was used to note both the number of task-oriented

acts of participation and the quality of the participation for each of the groups over four observations. Scores were also obtained on the California Test of Personality and the Children's Attitude Inventory. Mean reading scores and mean IQ scores were also computed for each group.

Since the purpose of this study was to determine relationships between ability, personality, attitudes and participation and quality of group process-oriented interactions, most of the data analyses were of a correlational nature, using group means and not individual scores.

The post-test revealed an increment in both the percent of task-directed participation and the mean quality rating. There was a consistent, moderate, positive relationship between the amount of task-directed participation and the overall quality rating that each group received. There was a decrease in the relationship between ability measures (reading and IQ scores) and performance measures (percent of task-directed participation and quality ratings) during the MATCH activities. Significant increments in attitudes toward problem solving were noted. This increase was significantly greater for one of the MATCH kits (The House of Ancient Greece).

Suggestions for Further Research

This report is an investigation of small group interaction in the context of a learning environment consistent with the value positions of process education. The MATCH kits previously identified as exemplars of process learning, provided such an environment. In addition, the videotape method of data collection provided a unique opportunity to capture

the spontaneity of small groups at work in the classroom. Both the curricula and the technique itself suggest several areas for fruitful study.

First, it is evident that the increase in interest in process education offers a challenge for new kinds of assessment techniques that will tap both the cognitive, and more important, the affective components of process curricula. More sophisticated approaches to assessment must be available to the investigators who are intrigued by, and convinced of, the worth of process education.

Second, although short-term investigations have merit as a basis for "instant feedback" to aid in evaluation of curricula, any substantive claims about the effects of such curricula must be supported by controlled and preferably, longitudinal studies.

Third, it is necessary to point out that limited exposure to process education (an hour a day in one subject field) cannot hope to reap the benefits which are possibly inherent in this approach to learning.

In order for further significant research to be done in the area of process education, more curricula must be available which meet the high criteria suggested by the value positions mentioned in this report.

Fourth, it is of some interest to teachers and curriculum developers to note that of the three process oriented kits used in this study, one seems to have unusual merit in changing attitudes toward problem solving. It is suggested that the nature of the activities in this kit which are more thoroughly structured than activities in other kits, may provide a possible explanation for this finding.

Since process education has as its theoretical base an altering of the roles appropriate for student behavior, perhaps the House of Ancient Greece, with its more completely defined roles and activities, becomes a stellar vehicle for positive change in learner behaviors. Further research is necessary to determine the optimum amount of structure and role definition that is necessary in curricula to alter learning patterns.

Finally, the use of the video-tape technique by investigators interested in small group interaction in the classroom offers a unique opportunity and a powerful research instrument. Continued use of tapes to study small groups will hopefully lead to more refined category systems for analysis of data.

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Appendix A

Instruments

CAI and CTP
Video-Take Evaluation Form
Teacher Questionnaire

Children's Attitude Inventory (Pretest)

THINKING ABOUT THINKING

In this part of the booklet, we want you to tell us how you feel about thinking and working on problems. There are many kinds of problems, such as the ones you have in arithmetic, but we are interested here in the kind of problem in which you have to think. Here is an example of the kind of problem we are talking about:

> Some men want to run a TV cable through a pipe that is six inches in diameter and several hundred feet long. The pipe has many twists and turns in it. The men have already tried to push the TV cable through the pipe from both ends, but the cable gets stuck in the pipe each time after only a few feet have gone in. The problem is to think of ways to get the cable through the pipe without cutting the pipe open.

Let's pretend your class has been given a problem like this one to solve. Listed on the next few pages are some things children might say about thought problems like this. On the separate answer sheet we want you to blacken the space under the column "T" for True if you say "yes" or agree with the statement. Blacken the space under "F" for False if you say "no" or disagree with the statements. Before you answer make sure that the number on the answer sheet is the same as the number of the question. When you answer, move your pencil point up and down to make a heavy black line. If you change your mind, erase your first mark completely.

There are questions about how you think and feel. There are no right or wrong arswers.

Answer each one, even if it seems hard to decide.

1. Yes No A problem like the one about the TV cable and the pipe is probably too hard for anyone in my grade to solve.

2. Yes No There is probably only one answer to a problem like this one.

3. Yes No If someone gets an idea that no one else has thought of, he should keep it to himself.

4. Yes No In a problem like this one, the best answer will be the one that most of the class decides is right.

5. Yes No On problems like these, it is best for children not to know too much; otherwise they will become confused.

6. Yes No If someone gets an idea that is different from everyone else's, the idea is probably not very good; otherwise other children would have thought of it too.

7. Yes No Ideas that are wrong don't need to be suggested, because they only waste time.

8. Yes No If no one is able to solve a problem like this one after a few minutes, then the problem is too hard for pupils in my grade to solve.

9. Yes No Most boys and girls like social studies better than science.

10. Yes No There is probably one way that is best for solving a problem like this one.

11. Yes No When there is a hard problem to solve, it doesn't help very much to have someone in the class who gets unusual ideas that no one else thinks of.

12. Yes No An idea for solving a problem that leads to a wrong answer still might be a good idea.

13. Yes No It would be best if everyone decided on one answer to this problem.

14. Yes No In most problems, poor ideas will not lead boys and girls to the right answer.

15. Yes No In solving problems, the most important thing to do is to try to figure out what is wrong with the ideas suggested rather than to think of new ideas.

16. Yes No In a problem like this one, the best answer should be the one that most children think is right.

17. Yes No The best answer should be the one that the teacher thinks is right.

18. Yes No New ideas should be tried out only after older ideas that have worked before fail to bring an answer.

19. Yes No Although several answers may be suggested, there is usually only one best answer.

20. Yes No Someone who keeps working on a problem that no one else in the class can solve is stubborn and selfish.

21. Yes No Anyone who suggests a lot of ideas usually keeps others from giving their ideas.

22. Yes No Anyone who asks questions after the teacher has finished giving directions is probably too lazy to solve the problem for himself.

23. Yes No Problems are not fair if they make you keep looking for new ideas in order to solve them.

24. Yes No If someone is not very good at thinking and solving problems by the time he gets into my grade, then it is too late.

25. Yes No The best workers will get one good idea and stick with it rather than think of many ideas, which might confuse them.

26 Yes No It is best to make sure that an idea is a good one before it is suggested to the class.

27. Yes No Some children are naturally born to be better thinkers than others, and there is nothing that can be done.

28. Yes No Boys and girls can learn to read and do arithmetic, but they cannot learn to think better or get better ideas.

29. Yes No People with a large number of ideas should keep most of them to themselves.

30. Yes No The person who is the best problem solver in class will probably be the one who gets an idea and then sticks with it.

Now we would like to know how you, yourself, might feel when working on problems like the one of getting the TV cable through the pipe. Remember, these questions are about how you think and feel, so there are no right or wrong answers. Circle the word "Yes" if you agree with the question. Circle the word "NO" if you disagree. Answer everyone, even if it seems hard to decide.

31. Yes No Do you feel that other children in class know more about what to do in working on a problem like this than you do?

32. Yes No Would you like to work on a problem like this one?

33. Yes No Would you like to work on a problem like this one, even though you might not be able to solve it?

34. Yes No Do you feel that you would know how to get started on a problem like this one?

35. Yes No Do you think that your ideas for solving this problem would be about as good as the ideas given by the other boys and girls?

36. Yes No Do you feel that you would be unable to solve problems like this one, even if you worked hard on them?

37. Yes No Do you think you have as much chance to solve a problem like this one as do other children?

38. Yes No If you worked on this problem, do you think that you would get any good ideas?

39. Yes No If most of the other children had solved this problem, but you had not, would you want to give up?

40. Yes No Do you think that many times your suggestions and ideas are not taken seriously by the rest of the class?

41. Yes No Do you think this problem is too hard for you to try to solve?

42. Yes No Do you feel that you shouldn't ask too many questions about problems in class?

43. Yes No Do you feel that other children in the class would understand the problem better than you?

44. Yes No Do you think that ideas given by other boys and girls for solving this problem would be better than your ideas?

45. Yes No Do you think that other children know more about problems of this kind than you do?

46. Yes No Do you enjoy drawing maps and pictures more than anything else in school?

47. Yes No Do you feel that the best thing about school is recess?

48. Yes No Do you feel that your ideas might be laughed at?

49. Yes No If you already had one good idea, would you rather stick with it than look for more ideas?

50. Yes No Do you feel that other children have an unfair advantage in working on problems like this one?

51. Yes No Although other children might not laugh out loud at your ideas, do you still feel that they would not like them?

52. Yes No Do you feel that other children would respect your ideas?

53. Yes No Do you think you have as many ideas as other boys and girls in class?

54. Yes No Do you feel that you are one of those children who is just not very good at thinking and at solving problems?

55. Yes No Do you think your ideas would be important enough to be taken seriously?

56. Yes No If you got an idea that no one else thought of, would you keep it to yourself, even if you were told to share ideas?

57. Yes No Would you want to give up after some of the other boys and girls got ideas and you didn't?

58. Yes No Would you want to keep working on a problem even if you felt you were not getting any good ideas?

59. Yes No Do you think you would want to keep working on a problem even if you knew it was too hard for you?

60. Yes No Do you think you would know how to go about finding an answer to problems like this one?

California Test of Personality (Form AA)

THIS PART of the booklet has some questions which can be answered YES or NO. Your answers will show what you usually think, how you usually feel, or what you usually do about things. Beginning with number 61, blacken the space under "T" for True if you agree with the statement and want to answer yes to it. Blacken the space under "F" for False if you disagree with the statements. Again, make sure that the number on the answer sheet is the same as the number of the question.

Remember, there are no right or wrong answers. Please answer all questions even if it is hard to decide.

SECTION 1

61. Do you usually keep at your work until it is done?

YES NO

62. Do you usually apologize when you are wrong?

YES NO

63. Do you help other boys and girls have a good time at parties?

YES NO

64. Do you usually believe what other boys or girls tell you?

YES NO

65. Is it easy for you to recite or talk in class?

YES NO

66. When you have some free time, do you usually ask your parents or teacher what to do?

YES NO

67. Do you usually go to bed on time, even when you wish to stay up?

YES NO

68. Is it hard to do your work when someone blames you for something?

YES NO

69. Can you often get boys and girls to do what you want them to?

YES NO

SECTION 2

70. Do your parents or teachers usually need to tell you to do your work?

YES NO

71. If you are a boy, do you talk to new girls? If you are a girl, do you talk to new boys?

YES NO

72. Would you rather plan your own work than to have someone else plan it for you?

YES NO

73. Do your friends generally think that your ideas are good?

YES NO

74. Do people often do nice things for you?

YES NO

75. Do you wish that your father (or mother) had a better job?

YES NO

76. Are your friends and classmates usually interested in the things you do?

YES NO

77. Do your classmates seem to think that you are not a good friend?

YES NO

78. Do your friends and classmates often want to help you?

YES NO

SECTION 3

79. Are you sometimes cheated when you trade things?

YES NO

80. Do your classmates and friends usually feel that they know more than you do?

YES NO

81. Do your folks seem to think that you are doing well?

YES NO

82. Can you do most of the things you try?

YES NO

83. Do people often think that you cannot do things very well?

YES NO

84. Do most of your friends and classmates think you are bright?

YES NO

85. Do you feel that your folks boss you too much?

YES NO

86. Are you allowed enough time to play?

YES NO

87. May you usually bring your friends home when you want to?

YES NO

SECTION 4

88. Do others usually decide to which parties you may go?

YES NO

89. May you usually do what you want to during your spare time?

YES NO

90. Are you prevented from doing most of the things you want to?

YES NO

91. Do your folks often stop you from going around with your friends?

YES NO

92. Do you have a chance to see many new things?

YES NO

93. Are you given some spending money?

YES NO

94. Do your folks stop you from taking short walks with your friends?

YES NO

95. Are you punished for lots of little things?

YES NO

96. Do some people try to rule you so much that you don't like it?

YES NO

SECTION 5

97. Do pets and animals make friends with you easily?

YES NO

98. Are you proud of your school?

YES NO

99. Do your classmates think you cannot do well in school?

YES NO

100. Are you as well and strong as most boys and girls?

YES NO

101. Are your cousins, aunts, uncles or grandparents as nice as those of most of your friends?

YES NO

102. Are the members of your family usually good to you?

YES NO

103. Do you often think that nobody likes you?

YES NO

104. Do you feel that most of your classmates are glad that you are a member of the class?

YES NO

105. Do you have just a few friends?

YES NO

SECTION 6

106. Do you often wish you had some other parents?

YES NO

107. Is it hard to find friends who will keep your secrets?

YES NO

108. Do the boys and girls usually invite you to their parties?

YES NO

109. Have people often been so unfair that you gave up?

YES NO

110. Would you rather stay away from most parties?

YES NO

111. Does it make you shy to have everyone look at you when you enter a room?

YES NO

112. Are you often greatly discouraged about many things that are important to you?

YES NO

113. Do your friends or your work often make you worry?

YES NO

114. Is your work often so hard that you stop trying?

YES NO

SECTION 7

115. Are people often so unkind or unfair that it makes you feel bad?

YES NO

116. Do your friends or classmates often say or do things that hurt your feelings?

YES NO

117. Do people often try to cheat you or do mean things to you?

YES NO

118. Are you often with people who have so little interest in you that you feel lonesome?

YES NO

119. Are your studies or your life so dull that you often think about many other things?

YES NO

120. Are people often mean or unfair to you?

YES NO

121. Is it all right to cheat in a game when the umpire is not looking?

YES NO

122. Is it all right to disobey teachers if you think they are not fair to you?

YES NO

123. Should one return things to people who won't return things they borrow?

YES NO

SECTION 8

124. Is it all right to take things you need if you have no money?

YES NO

125. Is it necessary to thank those who have helped you?

YES NO

126. Do children need to obey their fathers or mothers even when their friends tell them not to?

YES NO

127. If a person finds something, does he have a right to keep it or sell it?

YES NO

128. Do boys and girls need to do what their teachers say is right?

YES NO

129. Should boys and girls ask their parents for permission to do things?

YES NO

130. Should children be nice to people they don't like?

YES NO

131. Is it all right for children to cry or whine when their parents keep them home from a show?

YES NO

132. When people get sick or are in trouble, is it usually their own fault?

YES NO

SECTION 9

133. Do you let people know you are right no matter what they say?

YES NO

134. Do you try games at parties even if you haven't played them before?

YES NO

135. Do you help new pupils to talk to other children?

YES NO

136. Does it make you feel angry when you lose in games at parties?

YES NO

137. Do you usually help other boys and girls have a good time?

YES NO

138. Is it hard for you to talk to people as soon as you meet them?

YES NO

139. Do you usually act friendly to people you do not like?

YES NO

140. Do you often change your plans in order to help people?

YES NO

141. Do you usually forget the names of people you meet?

YES NO

SECTION 10

142. Do the boys and girls seem to think you are nice to them?

YES NO

143. Do you usually keep from showing your temper when you are angry?

YES NO

144. Do you talk to new children at school?

YES NO

145. Do you like to scare or push smaller boys and girls?

YES NO

146. Have unfair people often said that you made trouble for them?

YES NO

147. Do you often make friends or classmates do things they don't want to?

YES NO

148. Is it hard to make people remember how well you can do things?

YES NO

149. Do people often act so mean that you have to be nasty to them?

YES NO

150. Do you often have to make a "fuss" or "act up" to get what you deserve?

YES NO

151. Is anyone at school so mean that you tear, or cut, or break things?

YES NO

SECTION 11

152. Are people often so unfair that you lose your temper?

YES NO

153. Is someone at home so mean that you often have to quarrel?

YES NO

154. Do you sometimes need something so much that it is all right to take it?

YES NO

155. Do classmates often quarrel with you?

YES NO

156. Do people often ask you to do such hard or foolish things that you won't do them?

YES NO

157. Do you think that the boys and girls at school like you as well as they should?

YES NO

158. Do you think that the children would be happier if the teacher were not so strict?

YES NO

159. Is it fun to do nice things for some of the other boys or girls?

YES NO

160. Is school work so hard that you are afraid you will fail?

YES NO

SECTION 12

161. Do your schoolmates seem to think that you are nice to them?

YES NO

162. Does it seem to you that some of the teachers "have it in for" pupils?

YES NO

163. Do many of the children get along with the teacher much better than you do?

YES NO

164. Would you like to stay home from school a lot if it were right to do so?

YES NO

165. Are most of the boys and girls at school so bad that you try to stay away from them?

YES NO

166. Have you found that some of the teachers do not like to be with the boys and girls?

YES NO

167. Do many of the other boys or girls claim that they play games more fairly than you do?

YES NO

168. Are the boys and girls at school usually nice to you?

YES NO

Children's Attitude Inventory (Post-test)

THINKING ABOUT THINKING

In this part of the booklet, we want you to tell us how you feel about thinking and working on problems. There are many kinds of problems, such as the ones you have in arithmetic, but we are interested here in the kind of problem in which you have to think. Here is an example of the kind of problem we are talking about:

> Some men want to run a TV cable through a pipe that is six inches in diameter and several hundred feet long. The pipe has many twists and turns in it. The men have already tried to push the TV cable through the pipe from both ends, but the cable gets stuck in the pipe each time after only a few feet have gone in. The problem is to think of ways to get the cable through the pipe without cutting the pipe open.

Let's pretend your class has been given a problem like this one to solve. Listed on the next few pages are some things children might say about thought problems like this. On the separate answer sheet we want you to blacken the space under the column "T" for True if you say "yes" or agree with the statement. Blacken the space under "F" for False if you say "no" or disagree with the statements. Before you answer make sure that the number on the answer sheet is the same as the number of the question. When you answer, move your pencil point up and down to make a heavy black line. If you change your mind, erase your first mark completely.

There are questions about how you think and feel. There are no right or wrong answers.

Answer each one, even if it seems hard to decide.

1. Yes No A problem like the one about the TV cable and the pipe is probably too hard for anyone in my grade to solve.

2. Yes No There is probably only one answer to a problem like this one.

3. Yes No If someone gets an idea that no one else has thought of, he should keep it to himself.

4. Yes No In a problem like this one, the best answer will be the one that most of the class decides is right.

5. Yes No On problems like these, it is best for children not to know too much; otherwise they will become confused.

6. Yes No If someone gets an idea that is different from everyone else's, the idea is probably not very good; otherwise other children would have thought of it too.

7. Yes No Ideas that are wrong don't need to be suggested, because they only waste time.

8. Yes No If no one is able to solve a problem like this one after a few minutes, then the problem is too hard for pupils in my grade to solve.

9. Yes No Most boys and girls like social studies better than science.

10. Yes No There is probably one way that is best for solving a problem like this one.

11. Yes No When there is a hard problem to solve, it doesn't help very much to have someone in the class who gets unusual ideas that no one else thinks of.

12. Yes No An idea for solving a problem that leads to a wrong answer still might be a good idea.

13. Yes No It would be best if everyone decided on one answer to this problem.

14. Yes No In most problems, poor ideas will not lead boys and girls to the right answer.

15. Yes No In solving problems, the most important thing to do is to try to figure out what is wrong with the ideas suggested rather than to think of new ideas.

16. Yes No In a problem like this one, the best answer should be the one that most children think is right.

17. Yes No The best answer should be the one that the teacher thinks is right.

18. Yes No New ideas should be tried out only after older ideas that have worked before fail to bring an answer.

19. Yes No Although several answers may be suggested, there is usually only one best answer.

20. Yes No Someone who keeps working on a problem that no one else in the class can solve is stubborn and selfish.

21. Yes No Anyone who suggests a lot of ideas usually keeps others from giving their ideas.

22. Yes No Anyone who asks questions after the teacher has finished giving directions is probably too lazy to solve the problem for himself.

23. Yes No Problems are not fair if they make you keep looking for new ideas in order to solve them.

24. Yes No If someone is not very good at thinking and solving problems by the time he gets into my grade, then it is too late.

25. Yes No The best workers will get one good idea and stick with it rather than think of many ideas, which might confuse them.

26 Yes No It is best to make sure that an idea is a good one before it is suggested to the class.

27. Yes No Some children are naturally born to be better thinkers than others, and there is nothing that can be done.

28. Yes No Boys and girls can learn to read and do arithmetic, but they cannot learn to think better or get better ideas.

29. Yes No People with a large number of ideas should keep most of them to themselves.

30. Yes No The person who is the best problem solver in class will probably be the one who gets an idea and then sticks with it.

Now we would like to know how you, yourself, might feel when working on problems like the one of getting the TV cable through the pipe. Remember, these questions are about how you think and feel, so there are no right or wrong answers. Circle the word "Yes" if you agree with the question. Circle the word "NO" if you disagree. Answer everyone, even if it seems hard to decide.

31. Yes No Do you feel that other children in class know more about what to do in working on a problem like this than you do?

32. Yes No Would you like to work on a problem like this one?

33. Yes No Would you like to work on a problem like this one, even though you might not be able to solve it?

34. Yes No Do you feel that you would know how to get started on a problem like this one?

35. Yes No Do you think that your ideas for solving this problem would be about as good as the ideas given by the other boys and girls?

36. Yes No Do you feel that you would be unable to solve problems like this one, even if you worked hard on them?

37. Yes No Do you think you have as much chance to solve a problem like this one as do other children?

38. Yes No If you worked on this problem, do you think that you would get any good ideas?

39. Yes No If most of the other children had solved this problem, but you had not, would you want to give up?

40. Yes No Do you think that many times your suggestions and ideas are not taken seriously by the rest of the class?

41. Yes No Do you think this problem is too hard for you to try to solve?

42. Yes No Do you feel that you shouldn't ask too many questions about problems in class?

43. Yes No Do you feel that other children in the class would understand the problem better than you?

44. Yes No Do you think that ideas given by other boys and girls for solving this problem would be better than your ideas?

45. Yes No Do you think that other children know more about problems of this kind than you do?

46. Yes No Do you enjoy drawing maps and pictures more than anything else in school?

47. Yes No Do you feel that the best thing about school is recess?

48. Yes No Do you feel that your ideas might be laughed at?

49. Yes No If you already had one good idea, would you rather stick with it than look for more ideas?

50. Yes No Do you feel that other children have an unfair advantage in working on problems like this one?

51. Yes No Although other children might not laugh out loud at your ideas, do you still feel that they would not like them?

52. Yes No Do you feel that other children would respect your ideas?

53. Yes No Do you think you have as many ideas as other boys and girls in class?

54. Yes No Do you feel that you are one of those children who is just not very good at thinking and at solving problems?

55. Yes No Do you think your ideas would be important enough to be taken seriously?

56. Yes No If you got an idea that no one else thought of, would you keep it to yourself, even if you were told to share ideas?

57. Yes No Would you want to give up after some of the other boys and girls got ideas and you didn't?

58. Yes No Would you want to keep working on a problem even if you felt you were not getting any good ideas?

59. Yes No Do you think you would want to keep working on a problem even if you knew it was too hard for you?

60. Yes No Do you think you would know how to go about finding an answer to problems like this one?

California Test of Personality (Form BB)

THIS PART of the booklet has some questions which can be answered YES or NO. Your answers will show what you usually think, how you usually feel, or what you usually do about things. Beginning with number 61, blacken the space under "T" for True if you agree with the statement and want to answer yes to it. Blacken the space under "F" for False if you disagree with the statements. Again, make sure that the number on the answer sheet is the same as the number of the question.

Remember, there are no right or wrong answers. Please answer all questions even if it is hard to decide.

SECTION 1

61. Do you like to meet new people or introduce them to others?

YES NO

62. Do you usually do what is right even when you are angry?

YES NO

63. Are you often the leader when playing with other children?

YES NO

64. Are you afraid of some of the older boys and girls?

YES NO

65. Do you usually keep at your work even when other children want you to stop?

YES NO

66. Is it usually someone else's fault when things go wrong?

YES NO

67. Can you play alone happily when there is no one else to play with?

YES NO

68. Do you get excited when things go wrong?

YES NO

69. Do you usually keep at your work until it is done?

YES NO

SECTION 2

70. Can you usually keep other children from being mean to you?

YES NO

71. Are other boys or girls usually interested in what you are doing?

YES NO

72. Do your friends seem to think that you do things well?

YES NO

73. Do you feel bad because you don't have good times at parties?

YES NO

74. Do people seem to think that you will do well in life?

YES NO

75. Do you often feel bad because people do not notice your good points?

YES NO

76. Do the boys and girls notice your ability as much as they should?

YES NO

77. Do the other pupils often forget to ask you to help them?

YES NO

78. Do you often feel that the other children are better than you are?

YES NO

SECTION 3

79. Are you invited to the parties that you would like to attend?

YES NO

80. Do people seem to enjoy having you with them?

YES NO

81. Do you feel that many of the boys and girls do not like you?

YES NO

82. Do the other pupils do nice things for you as often as they should?

YES NO

83. Would you like to do things that older people think you should not?

YES NO

84. Are you allowed to help plan your own affairs?

YES NO

85. May you usually choose your own friends?

YES NO

86. Are you allowed enough time for play?

YES NO

87. Are you having a hard time because someone tries to boss you?

YES NO

SECTION 4

88. Are you troubled because you have to obey too many rules?

YES NO

89. Do you have as many rights as most other boys and girls?

YES NO

90. Are you allowed to do enough of the things you like?

YES NO

91. Do you often have to stand up for your rights?

YES NO

92. Are you kept away from too many interesting places?

YES NO

93. Do people try to boss you too much?

YES NO

94. Do other children like to have you go around with them?

YES NO

95. Do your friends usually help you when you are in trouble?

YES NO

96. Do you feel that many children you go around with are not real friends?

YES NO

SECTION 5

97. Are you usually asked to the parties where children have the most fun?

YES NO

98. Do the other children usually like the things you are doing?

YES NO

99. Do you feel that many of the boys and girls do not pay enough attention to you?

YES NO

100. Do many of the children at school seem to like you?

YES NO

101. Do you feel bad because you have so few friends?

YES NO

102. Do the other children seem to like to talk to you?

YES NO

103. Is it hard for you to talk when you are with people?

YES NO

104. Do you often feel like giving up when people think you are not doing well?

YES NO

105. Do you often meet people who are so mean that you hate them?

YES NO

SECTION 6

106. Do people think you are too careful in choosing friends?

YES NO

107. Does it usually hurt your feelings when people talk about you?

YES NO

108. Do you usually feel shy when you are around people?

YES NO

109. Do your friends seem to think that you say mean things about them?

YES NO

110. Do your friends think that your feelings are too easily hurt?

YES NO

111. Do you believe that you worry more than most children?

YES NO

112. Is it hard for you to forget the mistakes you make?

YES NO

113. Do you often think of many things that are dangerous?

YES NO

114. Is it all right to look down on people who do not know very much?

YES NO

SECTION 7

115. Do boys and girls need to be careful of the property of rich people?

YES NO

116. Should a person try to get even with someone who has been unfair?

YES NO

117. Do people really need to know what is right and what is wrong?

YES NO

118. Is it all right to break promises when you wish you had not made them?

YES NO

119. Is it necessary to be fair to people one does not like?

YES NO

120. Should children live up to the school rules?

YES NO

121. Should boys and girls who get low marks be kept out of the fun at school?

YES NO

122. Should one be nicer to pupils who are rich than to others?

YES NO

123. Should one make a practice of telling others about the mistakes they make?

YES NO

SECTION 8

124. When people make you angry do you usually keep it to yourself?

YES NO

125. Would you rather do nice things for your friends than have them do things for you?

YES NO

126. Should one tell others about their bad points?

YES NO

127. Do you like to notice the things your friends are doing?

YES NO

128. Do you usually dislike doing the things your friends are doing?

YES NO

129. Do you try to keep from bossing children who are smaller than you?

YES NO

130. Is it easy for you to admit when you are wrong?

YES NO

131. Do you usually argue with people who do not agree with you?

YES NO

132. Do you often say nice things to people when they do well?

YES NO

SECTION 9

133. Do you get along with the other children?

YES NO

134. Do you like to speak or sing in front of other people?

YES NO

135. Are some people so mean that you have to be unfair to them?

YES NO

136. Are many people so stubborn that they make you quarrel with them?

YES NO

137. Are things sometimes so hard at school that you stay away?

YES NO

138. Are some of the boys and girls so "stuck-up" that you have to get even with them?

YES NO

140. Do you have to watch people much of the time so they won't take advantage of you?

YES NO

141. Do you often have to get even with people who haven't treated you right?

YES NO

142. Do people often treat you so mean that you have to use bad language?

YES NO

SECTION 10

143. Do many people make you feel like starting a fight with them?

YES NO

144. Do you often have to get even with people who talk about you behind your back?

YES NO

145. Do many people seem to hate you without good reason?

YES NO

146. Are the younger children often so mean that you have to get tough to handle them?

YES NO

147. Do you like most of the things you have to do in school?

YES NO

148. Do you like to stay away from pupils of the other sex at school?

YES NO

149. Do you often feel bad because you get low marks in school?

YES NO

150. Do your classmates choose you as often as they should when they play games?

YES NO

151. Do the boys and girls at school often say things that make you feel bad?

YES NO

SECTION 11

152. Would you like it better if you could stay at home instead of going to school?

YES NO

153. Does someone at school make you feel that you are not very bright?

YES NO

154. Do many of the children at school try to keep away from you?

YES NO

155. Do the boys and girls seem to think that you get along well with them at school?

YES NO

VIDEO-TAPE EVALUATION FORM

Group _____ Teacher _____ Date _____ Time _____

1 _____ 4 _____

2 _____ 5 _____ Rator _____

3 _____ 6 _____ Date _____

CHECKLIST FOR UNITS OF VERBAL BEHAVIOR

1		2		3		4		5		6	
TASK	NON	TASK	NON	TASK	NON	TASK	NON	TASK	NON	TASK	NON

INTERACTIONS THAT MIGHT BE CONSIDERED AS "PROCESS ORIENTED" OR PROMOTE LEARNING IN SMALL GROUPS

A. ATTENDING/PARTICIPATING DIMENSION

Physical (1) no or lo involvement — high involvement

1 2 3 4 5

(2) wandering from group — no wandering

1 2 3 4 5

Verbal (3) no or lo involvement — high pupil involvement

1 2 3 4 5

(4) lo degree concentration — high degree concentration

1 2 3 4 5

(5) lo or no commitment to goal or task solution — high commitment to goal or task solution

1 2 3 4 5

B. COOPERATION/SHARING DIMENSION

(6) rejection or ignoring ideas of others — acceptance of other's ideas

1 2 3 4 5

(7) dismissing others' contributions — enlarging or adding to others' contributions

1 2 3 4 5

C. AGGRESSION/NON-AGGRESSION DIMENSIONS

Verbal (8) negative comments — supportive comments about contributions

1 2 3 4 5

(9) threatening atmosphere — acceptant atmosphere for expression

1 2 3 4 5

(10) hitting, bickering — absence of hitting, bickering

1 2 3 4 5

D. NON-MANIPULATION OF MATERIALS

(11) hoarding — sharing

1 2 3 4 5

(12) ignoring or abuse of materials — full manipulation and exploration with respect

1 2 3 4 5

(13) little discussion of materials — exhaustive discussion of materials

1 2 3 4 5

E. INDEPENDENCE/SELF-DIRECTED DIMENSION

(14) dependent on teacher — independent of teacher

1 2 3 4 5

(15) asks for aid out of group — no request for aid outside of group

1 2 3 4 5

(16) unsure of goal (fumbling) — sure of goal (purposive)

1 2 3 4 5

F. EMOTIONAL CLIMATE

(17) unhappy, unintegrated — happy; integrated

1 2 3 4 5

(18) io cohesive — hi cohesive

1 2 3 4 5

(19) dissatisfaction with group and products — satisfied with group and products

1 2 3 4 5

(20) a "non team" — a "team"

1 2 3 4 5

TEACHER QUESTIONNAIRE

We have gathered much data on the behavior of children using the MATCH kits on our video-tapes. However, we also would like to ask you teachers too, to candidly assess the kits. We would appreciate your answering the following questions. In outline form, if you wish.

1. What were the strengths of the Kits?

2. What were the weaknesses of the Kits?

3. If you were to use the Kits again, what changes would you make?

4. Did your children exhibit any new behaviors as a function of small group work: behaviors such as more cooperation, sharing of materials, etc.? (Both negative and positive behaviors should be cited.)

5. Did new working partnerships or friendships form as a result of the grouping?

6. How would you rate the degree of interaction of the groups while using the Kit?

7. Were you surprised at any of the children's behaviors during use of the Kit? If so, tell us what you noticed. A brief answer is fine.

Appendix B

Raw Data

RAW DATA PRETEST

		Participation Dimensions					Quality Dimensions					
GROUP	MATCH UNIT	Total Participation	TASK	Non-Task	%Task	Mean Quality Rating	Attending-Participating	Cooperation-Sharing	Aggression-Non Aggression	Manipulation Non Manipulation	Dependent Self-Directed	Emotional Climate
1	CITY	99	68	31	68.7	2.65	2.58	2.25	2.67	2.5	3.5	2.38
2	CITY	149	129	20	86.6	2.84	3.17	3.0	2.5	2.75	3.5	2.13
3	CITY	167	133	34	79.6	3.68	3.9	3.25	3.33	3.75	4.33	3.5
4	CITY	132	108	24	81.8	3.02	2.5	3.0	3.33	3.5	3.17	2.63
5	CITY	75	48	27	64.0	2.35	2.11	2.0	3.0	2.0	2.5	2.5
6	CITY	95	82	13	86.3	3.06	2.5	2.75	3.0	3.5	3.33	3.25
7	J.F	182	163	19	89.6	3.36	3.17	3.0	3.67	3.0	4.33	3.0
8	J.F.	179	142	37	79.3	2.95	3.17	2.67	2.33	3.0	4.0	2.5
9	J.F.	124	86	38	69.4	3.43	3.42	3.25	3.5	3.5	3.5	3.38
10	J.F	107	61	46	57.0	2.28	1.83	2.5	2.33	2.0	3.0	2.0
11	J.F	89	83	6	93.3	3.4	3.42	3.75	3.67	3.0	3.67	2.88
12	J.F	133	124	9	93.2	3.52	3.83	3.25	3.5	3.75	3.63	3.13
13	J.F	198	189	9	95.5	4.03	4.17	4.0	3.75	4.0	4.0	4.25
14	J.F	176	172	4	97.7	4.09	4.42	4.0	4.13	4.0	4.0	4.0
15	H.O.A.C.	170	158	12	92.9	4.13	4.08	4.0	4.0	4.0	4.67	4.0
16	H.O.A.C.	179	160	19	89.4	4.56	45	4.5	4.5	4.75	4.83	4.25
17	H.O.A.C.	212	200	12	94.3	4.68	4.83	5.0	4.5	4.25	4.75	4.75
18	H.O.A.C.	224	203	21	90.6	4.73	4.83	5.0	5.0	4.25	4.66	4.66
19	H.O.A.C	120	119	1	99.2	4.32	4.67	4.0	4.0	4.0	5.0	4.25
20	H.O.A.C.	120	95	25	79.2	3.72	3.92	3.25	4.0	4.0	3.67	3.5

RAW DATA TIME 1

		Participation Dimensions				Quality Dimensions						
Group	MATCH Unit	Total Participation	Task	Non-Task	% Task	Mean Quality Rating	Attending-Participating	Cooperation-Sharing	Aggression-Non Aggression	Manipulation-Non Manipulation	Dependent-Self-Directed	Emotional Climate
1	CITY	83	83	0	100.0	3.15	3.58	2.75	3.5	2.5	4.17	2.38
2	CITY	76	63	13	82.9	2.84	2.42	1.0	3.33	3.75	4.67	1.88
3	CITY	95	91	4	95.8	3.59	3.58	3.25	3.83	3.5	4.0	3.38
4	CITY	146	146	0	100.0	4.13	4.25	4.0	4.0	4.0	4.5	4.0
5	CITY	63	42	21	66.7	1.68	1.33	1.25	1.5	1.5	3.5	1.0
6	CITY	104	44	60	42.3	2.10	1.42	1.5	2.67	2.25	3.5	2.25
7	J.F.	76	54	22	71.1	3.16	2.83	3.5	3.83	3.0	3.17	2.63
8	J.F.	158	126	32	79.7	3.45	3.67	3.5	3.67	3.0	3.83	3.0
9	J.F.	82	75	7	91.5	2.59	2.58	2.5	2.83	2.0	3.5	2.13
10	J.F.											
11	J.F.	76	51	25	67.1	1.58	1.83	1.5	1.67	1.5	2.0	1.0
12	J.F.	148	128	20	86.5	2.81	2.92	3.25	3.5	1.5	3.33	2.38
13	J.F.	98	89	9	90.8	3.15	3.58	3.0	3.0	3.5	2.83	3.0
14	J.F.	116	113	3	97.4	2.99	3.17	2.5	2.83	2.75	3.17	3.5
15	H.O.A.C.	196	171	25	87.2	4.59	4.58	4.5	4.33	4.25	5.0	4.88
16	H.O.A.C.	130	63	67	48.5	2.71	2.83	2.25	3.25	2.0	3.67	2.25
17	H.O.A.B	165	141	24	85.5	4.45	4.58	4.5	4.17	4.5	4.83	4.13
18	H.O.A.B.	205	84	121	41.0	2.09	1.83	2.25	2.0	2.0	2.83	1.63
19	H.O.A.C.	227	217	10	95.6	5.00	5.0	5.0	5.0	5.0	5.0	5.0
20	H.O.A.B.	127	115	12	90.5	3.90	3.92	3.75	4.0	3.5	4.83	3.38

RAW DATA TIME 2

		Participation Dimensions				Quality Dimensions						
Group	MATCH UNIT	Total Participation	TASK	Non-TasK	%TasK	Mean Quality Rating	Attending-Participating	Cooperation-Sharing	Aggression-Non-Aggression	Manipulation-Non-Manipulation	Dependent-Self-Directed	Emotional Climat-
1	CITY	126	48	78	38.1	2.86	2.33	2.75	3.0	2.75	3.43	2.88
2	CITY	141	133	8	94.3	4.57	4.5	4.5	4.17	4.5	5.0	4.75
3	CITY	170	151	19	88.8							
4	CITY	100	93	7	93.0	3.58	4.25	2.75	2.5	3.25	5.0	3.75
5	CITY	61	46	15	75.4	2.58	2.17	2.50	2.83	2.75	2.5	2.75
6	CITY	81	64	17	79.0	3.42	3.5	3.25	3.5	3.75	3.0	3.5
7	J.F.	123	101	22	82.1	3.86	3.25	3.0	4.0	4.25	4.67	4.0
8	J.F.											
9	J.F.											
10	J.F.											
11	J.F.	26	23	3	88.5	2.42	1.58	2.0	4.0	3.5	1.67	1.75
12	J.F.	121	104	17	86.0	3.53	3.5	3.25	3.83	3.75	3.83	3.0
13	J.F.	44	36	8	81.8	2.17	1.17	2.0	3.75	2.5	1.83	1.75
14	J.F.	18	15	3	82.3	1.78	1.0	1.5	2.67	2.0	2.0	1.5
15	H.O.A.C.	136	121	15	96.0	3.85	3.86	3.5	3.75	4.0	4.0	4.0
16	H.O.A.C.	74	66	8	89.2	3.11	2.67	3.5	3.33	3.0	3.25	2.88
17	H.O.A.C.	98	98	0	100.0	4.79	4.92	4.75	4.5	5.0	4.67	4.88
18	H.O.A.C.	160	130	30	81.3	4.62	4.5	4.75	4.33	4.75	5.0	4.38
19	H.O.A.C.	162	160	2	98.8	4.64	4.75	4.5	4.5	4.5	4.83	4.75
20	H.O.A.C.	143	112	31	78.3	3.94	3.83	3.5	3.83	3.75	5.0	3.75

RAW DATA POST-TEST

		Participation Dimensions					Quality Dimensions					
Group	MATCH UNIT	Total Participation	TASK	Non-TASK	%TASK	Mean Quality Rating	Attending-Participating	Cooperation-Sharing	Aggression-Non-Aggression	Manipulation-Non-Manipulation	Dependent-Self-Directed	Emotional Climate
1	CITY	97	94	3	97.1	3.75	3.83	3.5	3.5	3.83	4.0	3.83
2	CITY	86	73	13	85.0	3.67	3.5	3.83	3.5	3.67	3.83	3.67
3	CITY	102	94	8	92.8	4.38	4.5	4.5	4.0	4.25	4.5	4.5
4	CITY	149	146	3	98.4	4.52	4.63	4.25	4.25	4.5	4.75	4.75
5	CITY	70	58	12	83.1	1.93	2.5	2.25	1.5	2.83	1.0	1.5
6	CITY	114	89	25	78.4	2.74	2.83	3.0	2.83	3.0	2.5	2.25
7	J.F.	187	128	59	64.4	3.51	3.08	3.5	3.83	3.5	3.67	3.5
8	J.F.	155	139	16	89.7	3.83	3.92	3.5	3.83	4.0	3.83	3.88
9	J.F.	97	87	10	90.1	3.31	3.00	3.08	3.5	3.67	3.5	3.08
10	J.F.	121	101	20	83.4	3.03	3.08	3.25	3.0	3.0	2.83	3.0
11	J.F.	117	103	14	88.0	2.57	2.83	2.5	2.83	2.5	2.5	2.25
12	J.F.	112	106	6	94.6	3.67	3.08	3.25	3.83	3.75	4.5	2.88
13	J.F	140	184	6	96.8	4.79	5.0	4.75	4.75	5.0	5.0	4.25
14	J.F.	223	208	15	93.8	4.66	4.75	4.0	4.75	4.83	5.0	4.63
15	H.O.A.C.	199	199	0	100.0	4.96	5.0	4.75	5.0	5.0	5.0	5.0
16	H.O.A.C.	174	168	6	96.6	4.36	4.58	4.0	4.33	4.5	4.75	4.0
17	H.O.A.C.	126	120	6	95.2	4.01	4.58	3.75	3.16	4.0	4.67	3.88
18	H.O.A.C.	177	154	23	87.0	3.49	3.92	4.0	3.83	3.75	4.83	3.63
19	H.O.A.C.	187	165	22	88.2	4.63	4.75	4.25	4.5	4.5	5.0	4.75
20	H.O.A.C.	148	131	17	88.5	4.65	4.83	4.0	4.83	4.75	4.83	4.63

RAW DATA CAI PRE AND POST-TEST, MEAN IQ, MEAN READING SCORES

Group	MATCH UNIT	CAI PRETEST Part A	Part B	Total	CAI POST-TEST Part A	Part B	Total	mean IQ	Mean Reading Scores
1	CITY	17.0	16.6	33.6	18.6	17.4	36.2	95	4.3
2	CITY	16.75	16.5	33.25	12.5	15.0	30.0	100	3.9
3	CITY	16.0	15.0	31.0	19.6	14.6	34.2	103	5.0
4	CITY	16.6	17.2	31.8	15.75	12.25	28.0	94.8	4.3
5	CITY	11.83	10.83	22.67	13.25	14.25	27.5	99.2	3.0
6	CITY	12.83	14.0	19.83	17.0	15.2	29.8	92.5	3.2
7	J.F.	24.8	23.6	48.4	28.6	20.8	49.4	115.8	1.7
8	J.F.	18.67	15.5	34.17	18.33	18.5	36.83	116.5	7.0
9	J.F.	15.17	16.83	32.0	16.0	18.5	34.33	100.6	5.2
10	J.F.	17.2	16.20	33.4	17.33	15.5	32.83	101.5	6.1
11	J.F.	15.17	19.5	34.67	18.2	21.0	39.2	112.7	4.9
12	J.F.	15.33	17.0	32.5	14.75	14.0	33.0	113.4	5.1
13	J.F							115.	7.1
14	J.F							120.6	7.4
15	N.O.A.C.	17.33	21.0	38.33	20.8	21.8	42.8	124.8	6.4
16	N.O.A.C.	18.40	18.8	37.2	20.5	23.5	44.75	112.5	3.1
17	N.O.A.C.	19.60	21.4	41.0	23.0	26.2	49.2	121.	6.5
18	N.O.A.C.	21.17	21.5	42.67	23.2	18.8	41.6	120.8	6.0
19	N.O.A.C.	19.67	23.33	43.0	23.6	24.0	47.6	122.	8.5
20	N.O.A.C	21.2	18.6	39.8	21.25	22.0	43.25	120.6	7.2

RAW DATA C.T.P. RESULTS OF PRE AND POST-TEST

Group	MATCH UNIT	Self-Reliance		Sense of Personal Worth		Sense of Personal Freedom		Feeling of Belonging		Withdrawing Tendencies		Social Standards		Social Skills		Anti-Social Tendencies		School Relations	
1	CITY	6.4	6.8	8.0	6.8	8.6	8.4	7.8	7.0	6.4	5.4	8.4	4.8	7.6	6.2	6.8	5.6	6.4	4.4
2	CITY	8.5	5.5	8.75	4.5	7.0	6.0	7.75	6.25	5.0	5.0	9.75	6.75	9.5	8.0	7.0	5.25	5.75	4.25
3	CITY	5.6	6.0	7.2	6.0	4.4	5.8	8.4	6.4	5.4	5.6	6.4	6.4	7.0	6.8	5.8	5.6	6.8	5.8
4	CITY	8.4	5.0	6.2	5.0	4.8	5.0	6.0	3.75	4.2	4.5	7.0	6.25	5.0	7.0	4.2	4.25	5.2	4.5
5	CITY																		
6	CITY																		
7	J.F.	7.2	5.6	10.2	10.0	10.0	8.4	10.8	8.09	7.8	8.8	10.0	7.2	9.2	6.4	9.2	6.0	6.8	6.4
8	J.F.	5.83	6.33	8.17	7.0	9.67	7.67	9.33	6.17	7.5	6.67	7.67	6.17	8.0	6.5	7.83	6.17	7.33	6.0
9	J.F.																		
10	J.F.																		
11	J.F.	6.5	7.0	8.17	10.0	10.0	8.0	8.5	7.2	7.33	6.8	9.83	5.6	8.5	7.5	7.0	6.75	7.83	7.25
12	J.F.	5.5		6.67		7.67		7.6		5.83		8.67		7.5		6.67		7.33	
13	J.F.																		
14	J.F.																		
15	H.O.A.G.	6.0	5.8	7.67	7.8	10.0	7.8	9.0	7.0	6.33	8.0	10.0	5.6	8.0	8.0	6.33	7.2	5.67	7.0
16	H.O.A.G.	7.8	8.0	9.2	11.25	10.8	10.75	10.2	8.25	8.80	8.0	9.6	6.5	8.4	9.0	8.40	8.75	10.0	6.0
17	H.O.A.G.	6.25	6.6	6.75	9.0	9.25	9.6	8.75	8.0	6.0	7.4	9.5	7.6	7.5	8.2	7.5	7.6	8.0	7.6
18	H.O.A.G.	6.5	5.2	5.33	4.2	9.0	6.2	7.0	4.8	5.67	6.2	10.5	7.0	6.83	7.2	6.5	4.6	7.2	4.2
19	H.O.A.G.	7.67	7.2	8.0	8.2	9.83	10.0	9.33	6.2	9.83	10.4	9.0	7.6	8.5	9.4	8.67	9.2	8.67	6.4
20	H.O.A.G.	7.0	7.5	9.6	7.0	10.0	9.0	9.0	7.0	7.6	7.0	10.6	8.0	8.8	8.5	8.6	8.25	9.4	6.75

Appendix C

Quoted Answers from Teacher Questionnaire
Children's Comments about MATCH Kits
Examples of Children's Comments
Teachers' Letter in Support of MATCH Kits

Quoted Answers from Teachers' Questionnaire

Concerning Use of MATCH Kits

1. What were the strengths of the Kits?

"high interest, something for everyone to <u>do</u>"

"materials are all together so that each of 5 groups can learn something different at the same time, and reinforce their learning by teaching others"

"materials were generally unfamiliar to the children and the sequence was good and easy to follow"

"the open-ended format of exploring and seeking information. . . ."

". . . sparked creativity and problem-solving techniques"

"directions to the children so they could work by themselves"

". . . mysterious objects to challenge the children"

"availability of extra references, books, film, etc."

2. What were the weaknesses of the Kits?

"possibility of materials to make a model villa?"

"separate notebooks for children's notes as they went through the process of discovery, to keep track of their objective thinking"

"not time enough!"

"magic windows and books were not interesting for 10 year olds"

"the magnetic board was too small for demonstrations and the magnets kept falling off"

"photo albums took too long to assemble"

"maybe an English translation of at least the comic book?"

"slippers didn't fit the big boys"

"the second film strip disappointed . . . the excavation had not been protected. . . ."

3. If you were to use the Kits again, what changes would you make?

"how about some grain to grind in the mortar?"

"a previous discussion of the history of light so that the children would know about oil lamps"

"more coins, please"

"more emphasis on future building of cities and how we can cut down on pollution and waste"

"make sure <u>time</u> available to explore the many avenues opened by this kit"

4. Did your children exhibit any new behaviors as a function of small group work: behaviors such as more cooperation, sharing of materials, etc.? (Both negative and positive behaviors should be cited.)

"groups broke up some cliques"

"cooperated beautifully in teaching others"

"worked together . . . more sharing of ideas and resources"

". . . previous stereotypes ('smart,' 'dumb') were lost due to manipulative and creative situations"

"my 'problems' (children) worked much better, as a whole in the groups"

5. Did new working partnerships or friendships form as a result of the grouping?

"to some extent"

"yes--'fathers' met as groups often to plan activities, and 'sons' and 'daughters' worked together too"

"very definitely--best friend groups have grown and broadened"

"only on a temporary basis, but that's something"

6. How would you rate the degree of interaction of the groups while using the Kit?

"very good--hope it lasts until next social studies project?

"100%--it was great!"

"high--several conflicts but more interaction during and after use of this unit"

7. Were you surprised at any of the children's behaviors during use of the Kit? If so, tell us what you noticed. A brief answer is fine.

"one of my boys who has a short attention span for individual work, was <u>vitally interested</u> in working in a group"

". . . and incessant talker was told by his peers to keep quiet (so group could work)"

"especially rewarding to the poor readers in the class . . . they ended up being 'experts' in something for a change (in use of chopsticks, sumi painting, etc.)"

"some under achievers blossomed as leaders and have gained status in other activities as well"

"a group of boys drew the ladies room . . . they were totally uninhibited in modeling the chiton and jewelry"

Children's Comments About MATCH Kits

Unsolicited comments from some children after their MATCH experience are quoted below. Included here also are several reproductions of children's comments about their kits.

"I liked to use the things, chopsticks, and stuff"

"What I liked best was presenting the unit to the class"

"I liked being the father"

"(these kits are) better than reading"

"(you can) see the things rather than read about them"

". . . do things, not read"

"it was fun to figure out what things were"

"I liked learning specific things about the culture"

". . . working with friends is good"

"I would really like to do another project like the House of Ancient Greece"

"this is a good way to teach social studies"

[illegible] Tiburzo 4/7/71

Journal

About a month ago our teacher told us we were going to do a unit on Japan. And ever since then we have been working in our Japanese families, and seeing films. It was a ball. We learned many things about Japan. We learned how to use chopsticks, and many of the Japanese customs. I thought the program was fun and interesting. I liked the food we had with the Japanese food and chop sticks. It really was a fun project.

Japanese Journal 4/7/11

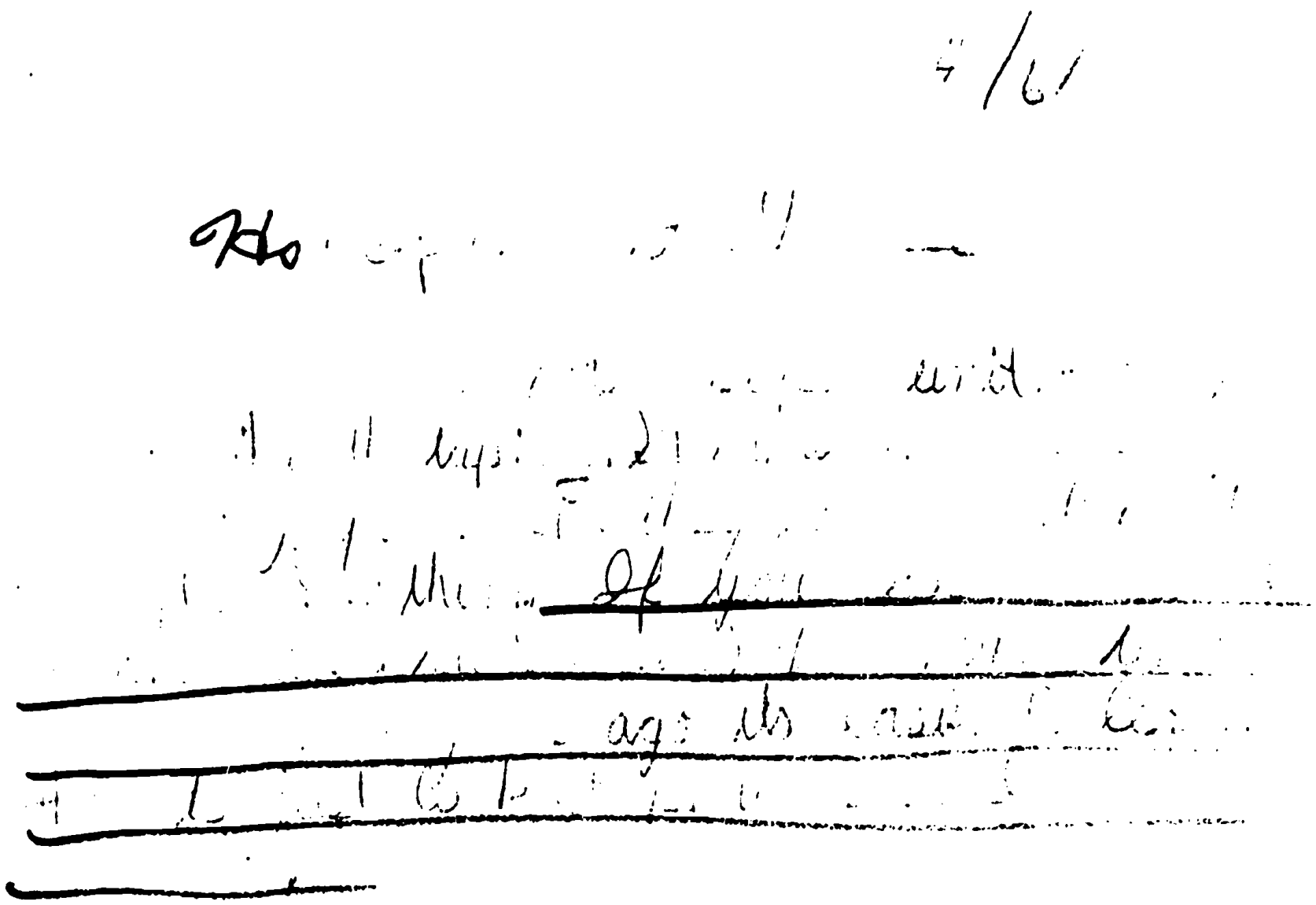
"Japanese Family"

I really liked this because we learned alot about the calligraphy and other interesting things. We also studied some scrolls and flower arrangements. Other groups learned how to work chop sticks. I wish I could learn more about the calligraphy and how to pronounce some of their words. I think it would be cool if there was only boys in one class and girls in the other. I liked it a lot overall it was fun.

Mark N

Betsy Stanton

I was a daughter in the Tanaka family. I helped with the housework. And I didn't bother dad with little questions. I was in a demonstration about clothes then I did the language. And I ate with the rest of the children. I tried on clothes. I let dad choose the T.V. show. I go to school and do my homework before watching T.V.. I was hostess for a Japanese party. Because the daughters serve I helped wash the dishes in my family.



"House of Ancient Greece"

I liked the house of Ancient Greece, because I could see the objects we were studying. I learned about them. I enjoyed this social studies unit more than any other.

House of Ancient Greece 4-5-71

I thought the "House of Ancient Greece" was interesting. I liked the coins and the pottery the best. If only those things were real, wow they'd be worth plenty. If I find them, or I was a scientist and found them, I wouldn't sell them for money, (because they would be worth alot) I would keep them and treasure them for the rest of my life.

The End

5-6-11

I think the "House of Ancient Greece" was ~~so~~ very good. I learned alot about Greece as it was long ago. The things I liked about it were the objects that we examined. I think the time tooken was not wasted also. The test is complete, and good.

ITHACA

Ithaca City School District

NORTHEAST ELEMENTARY SCHOOL

May 25, 1971

Dear Colleagues;

We should like to recommend that the Ithaca School District purchase at least one kit of "Cities", " The Japanese Family", and "House of Ancient Greece" of the Match Series. We have used two of the kits at Northeast School and have found them to be by far the best materials for social studies available. The interest of the children was high at all times. The ways of observing and inferring from these observations as a method of study is most applicable to the philosophy in our school. Since we use the process approach in science, the method is understood by most children.

Evaluations written by the children afterwards indicated their interest in and feeling toward the kits was very positive.

Since money is a great factor, no school can afford a kit on its own, but if the district had at least the three, schools could check out kits and have the use of one for a three-four week period.

Sincerely,

Ernestine Q. Wright
Ernestine Q. Wright
Doris Head
Doris Head
Charlotte Lentz
Charlotte Lentz
Marian Norberg
Marian Norberg
Madge Green
Madge Green